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LOWER ABDOMINAL PAINS OF CERVICAL ORIGIN

THEIR GENESIS AND TREATMENT*

BY

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The Cervical Syndrome

The cervix in its short length of one inch is unique in that, while it is freely exposed below to external injury and infection, above it is in immediate relation to the abdominal cavity and its sensitive peritoneal lining. Further, it is significant that the cervix is the sole region in the body in which a relatively simple damage is prone to persist as a permanent sore. The general pathological features of this common lesion are well known and need not be discussed here.

Alike in its frequency and in the suffering with which it is associated, the cervical syndrome constitutes one of the most important entities in gynaecology. In its typical form it possesses certain characteristic features which I first described in 1930 (Young, 1930) and which may be stated shortly as follows:

Characteristic Features

1. It is predominantly a condition found in parous women, and in a large majority it can be traced historically to the last birth or abortion. In a more or less consecutive series of 349 such patients admitted to hospital under my care, 304, or 87 per cent., were parous, and the puerperal correlation was evident in nearly 90 per cent. of these.

2. The main symptom is chronic distress and pain situated in the lower abdomen and, less commonly, in the lumbosacral area of the back. Dyspareunia is almost invariably present: the condition is the most important cause of dyspareunia in parous women.

3. Leucorrhoea coinciding chronologically with the pain, or not infrequently preceding it, is a common feature.

4. There is an absence of gross pelvic pathology, and this, combined with the marked local and general symptomatology, is a common cause of confusion in diagnosis and of error in treatment. The lesion underlying the syndrome is generally caused by the trauma of labour, on which a chronic inflammation of the cervix is implanted. The existence of a similar lesion without pre-existing trauma explains the relatively rare cases found in nulliparae.

5. While chronic ill-health is a common end-result, the abdominal distress may often extend over a long period without producing any corresponding deterioration in the general state of the patient. At the same time, from an early stage there may be profound systemic disturbance in the shape of general weakness, dyspepsia, marked nervous reactions, "rheumatism," etc., while local functional disorders may also develop early—for example, irritability of the bladder and lower bowel.

6. In a large proportion of cases treatment of a simple nature directed to the underlying lesion is strikingly successful.

The history in many instances is characteristic. Beginning with some such expression as "ever since the birth of my baby," it tells of years drawn out with an agony both of spirit and of body. As it unfolds one can recognize the young, healthy, and buoyant bride becoming gradually transformed into the ailing matron, plaintive, peevish, sleepless, and dyspeptic, who, as in Jane Austen's Mary Musgrove, has formed a theme for easy sarcasm throughout the ages. The branks and the ducking-stool were the treatment meted out to such "scolding wives" in former days. We have tempered the harshness of those more inhumane times, but it is doubtful if we have in any great measure relieved the misery of this large population in our midst. The present inquiry had its origin many years ago in the gradual recognition, among the chronic sufferers in a busy gynaecological clinic, of a large group with an essentially similar complex, for whom, in the absence of any clear underlying pathology, no adequate treatment was possible. Many, indeed, belonged to a considerable and a peculiarly distressing class in that they had suffered frequent and varied operative treatment, both minor and major, without benefit. The scarred abdomen often witnessed to multiple operations during which in succession, it might be, the appendix and the ovaries had been removed, the womb had been fixed, and, finally, in a last desperate effort, the pelvis had been swept clean. Some of us have seen many examples of such shattered lives. It is not surprising that in a large number the mental state should have given rise to anxiety for which, as revealed in the history, the psychiatric specialist had been summoned. Recently I saw one such woman who for twenty-three years had suffered from more or less constant abdominal distress and whose organs had been removed at successive operations. The diseased cervix alone had escaped! Within a few days of treatment directed to this lesion the abdominal pain had gone, and six months later her life and health had been completely revolutionized.

* Based upon the Honorary Presidential Address to the Glasgow University Medico-Chirurgical Society, October 28, 1937, and the Annual Address to the Oxford Medical Society, November 12, 1937.

The Pain Element

In this place we are specially concerned with the pain element in the cervical syndrome; later pages will be devoted to a study of its genesis and treatment. The relatively scant attention which in the past has been given to the diseased cervix as a source of chronic abdominopelvic pain is due to three considerations: (1) the common clinical observation that cervical trauma and infection may be painless; (2) the well-known fact that, like other hollow viscera, the healthy cervix is insensitive to stimuli which provoke pain on surface tissues; (3) the frequent persistence of pain in women whose uterus has been completely removed for severe cervical infection. At first sight this triple argument would seem to have much force behind it. At the same time, as we shall attempt to show further on, each item is relevant only in so far as it fails to take into account all the available data. Thus in regard to (1) and (2) it is easy to demonstrate that in certain conditions the diseased cervix, so far from being insensitive, may acquire a most acute sensitiveness to stimuli which ordinarily are completely painless. In respect of (3) the conditions after removal of the cervix often resemble those found in a painful scar left after an operation in a sensitive area.

Visceral Pains

Before we pass on to consider the nature and the genesis of the pain phenomena of our syndrome a brief reference must be made to the present position of our knowledge on the causation of visceral pain in general. It is a common observation in abdominal symptomatology that the hollow intraperitoneal viscera, which are mesially situated in regard to their embryonic development, may in disease be concerned in the production of two completely different types of pain: (*a*) true visceral pain, and (*b*) referred or reflex pain. The viscera themselves are insensitive to the stimuli that ordinarily provoke pain on the body surfaces—for example, cutting, burning, etc.—but it is now generally agreed that pain is appreciated by a viscus when it is exposed to those intrinsic influences which are prone to disturb its function. Such visceral sensations have certain characteristic and well-defined features. In the first place, *they are typically, if not always, mesial in situation*—the epigastrium in the case of the stomach, above and around the umbilicus in the case of the small bowel and appendix, and below the umbilicus in the case of the large bowel; in the second place, such true visceral pains are usually only *imperfectly localized* by the patient; and, thirdly, they are *unassociated with hyperalgesia of the corresponding area and muscular rigidity* of the corresponding part of the abdominal wall. A common example of such mesial visceral pain in a lateral organ is the initial umbilical pain occurring in obstructive appendicitis. Referred or reflex pain is felt on the body surface at a site which in general is determined by the location of the organ, though it may be projected on to a distant area of the abdominal wall or other somatic surface. Such referred pains are *typically associated with hyperalgesia and muscular rigidity*, and they are therefore *well localized*.

It is now generally agreed that while true visceral pain is felt directly in the organ through the medium of the splanchnic nerves, its site is determined by the spinal segment corresponding to the primitive development of the organ. Referred or reflex pain, on the other hand, has been the topic of much controversy. Until recently the explanation generally accepted was that of Mackenzie (1920), who postulated that the stimuli originated in the diseased viscus and were referred via the sympathetic nerves to the cord, where they created an "irritable focus." In this view a simple surface stimulus which is innocuous under healthy conditions is, by its passage through this irritable focus in the corresponding spinal segment, now appreciated as pain by the higher centres. This was Mackenzie's viscerosensory reflex, the muscular rigidity in the same surface area arising from a visceromotor reflex based on a similar segmental arc. The work of Morley (1931) and others has cast serious doubt on the validity of these conceptions, and there is now evidence that referred pain, with its associated hyperalgesia, muscular rigidity, and tenderness, is dependent not upon visceral impulses but upon impulses derived from a secondary irritation of the adjacent peritoneum—the so-called peritoneo-cutaneous and the peritoneo-muscular reflexes of Morley. Thus the site of the referred pain depends upon the site of the peritoneal irritation. The pain in the iliac fossa in a typical case of appendicitis, for example, is referred segmentally to the abdominal wall, not from the appendix itself but from the inflamed parietal peritoneum. In support of this view Morley quotes the observation that the site of surface tenderness in gastric ulcer varies with the position of the stomach within the abdomen. A further common example pointing a similar lesson is found in ectopic pregnancy. The referred pain in this condition is localized to the iliac fossa when the extravasated blood is located in the pelvis and lower abdomen, but when, as often happens, the fluid blood flows upwards to the under surface of the diaphragm it provokes the shoulder pain of phrenic stimulation.

The intrinsic mechanism underlying the actual sensation at the referred site has given rise to much speculation. That the skin and other structures of the abdominal wall are directly concerned is proved by the observations of Lemaire (1926) and Morley (1931), who abolished the spontaneous pain by means of a local anaesthetic applied to the corresponding skin area. Morley (1929) found that this procedure did not necessarily abolish deep tenderness. That the referred sensation is dependent, not on an alteration in the "sensitiveness" of the higher nerve levels, such as Mackenzie and others have postulated, but on some local change induced at the nerve terminals in the skin, has been put forward by some writers. Verger (1927), for example, has suggested that the original stimulus in the abdomen induces reflex vasomotor changes in the corresponding segmental skin, while Spameni and Lunedei (1927) suggest that centrifugal impulses passing to the skin result in local biochemical changes. Recently Lewis (1937) has adduced striking evidence for the view that the spreading hyperalgesia round a focus of damaged skin is dependent upon stimuli which radiate along a specialized type of nerve—named by him the "nocifensor nerves"—to the distant areas and there induce biochemical changes. In this way the threshold for pain for the ordinary sensory nerves in the corresponding area is lowered. Lewis's work so far has concerned itself solely with the demonstration of the peripheral manifestations of this phenomenon.

The Lesion and its Pains

I have already indicated that the dominating symptom in the complex which is the subject of this discourse is abdominal pain. In some cases the area of pain and tenderness may be widespread over the abdomen, but in the large majority it is restricted to the lower segment. In a typical case the chief emphasis is found in the iliac fossae, and especially the left iliac fossa. Cases with a

restriction to one iliac fossa exhibit a preponderance on the left side in the proportion of about four to one.

Mesial Visceral Pain

Although this does not ordinarily constitute the main pain symptom, I will discuss it first because it would seem in its genesis to possess the features which are generally ascribed to a visceral pain. It is expressed in two clinical forms: (*a*) As a *spontaneous* discomfort or actual pain vaguely located to the retropubic area and lower mesial abdomen (Fig. 1). It is rarely present alone,

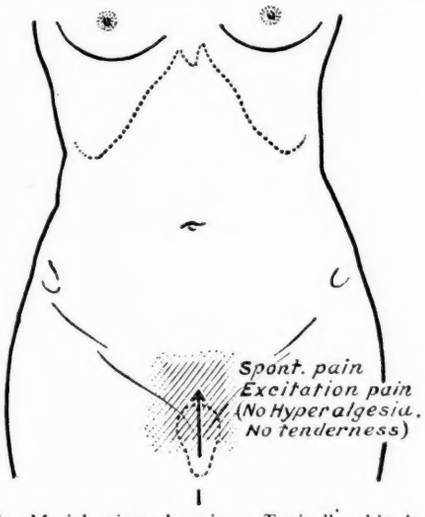

FIG. 1.—Mesial visceral pain. Typically this is low in situation and it is poorly localized. It is present as (*a*) spontaneous and (*b*) excitation pain.

and it is not associated with hyperalgesia, muscular rigidity, and local tenderness on pressure. Its main and almost invariable clinical manifestation is (*b*) as a pain felt immediately when the finger placed in the vagina exerts pressure against the cervix. Under these conditions the sensation may be acute, and in severe cases may cause the patient to cry out because of its intensity. Typically the patient has difficulty in locating it; she may state that it is felt deeply in the pelvis or she may place her hand somewhat vaguely over the pubes and lower abdomen. In the indefiniteness of its mesial localization it at once suggests the true visceral pain of other diseased states. To the pain excited by pressure on the cervix in this manner I have applied the term *visceral excitation pain*.

To appreciate the significance of this excitation pain we have to remember that in health the cervix may be moved in any direction through a considerable range without pain being elicited. The fact that in a typical case pain can be induced by even the slightest pressure endows it therefore with a considerable clinical significance. In passing it may be remarked that fixation of the cervix by contracture in traumatic or inflammatory tissue is a common finding in cases exhibiting this sign. Displacement of the organ is also not infrequent, either laterally or posteriorly, although, as I have elsewhere shown, this displacement may in some cases be due to muscle spasm, which disappears under anaesthesia and after treatment. Further, although a lesion of the kind which we have previously described constitutes the essential causal factor, in many instances, and so long as the inflammatory condition is limited to the lower vaginal cone of the cervix, both the spontaneous and the excitation pains may be absent. Moreover, it is notorious that even when the external and visible signs of infection have resolved after treatment the pains may persist, either because of a remaining more deep-seated inflammatory change or because of the sensitiveness of the residual scars. The complex sometimes follows trauma that results in scarring without the supervention of any external evidence of infection. It is clinically important to observe that in cases exhibiting excitation pain *dyspareunia* is both a characteristic and a distressing symptom. The condition indeed is the most common cause of dyspareunia in the parous woman.

A further point of considerable importance to note is that the cervix itself in these cases often acquires a true inherent sensitiveness. In the healthy woman the cervix, like other hollow abdominal viscera, can be subjected to ordinary trauma without the creation of pain. It can, for example, be seized between the blades of a vulsellum forceps without suffering being caused. In the condition under discussion this insensitiveness is often abolished. The cervical lips are no longer immune to even such mild trauma, and in exceptional cases, indeed, I have found that the gentle pressure of a probe against the cervical surface may elicit a severe pain reaction. These pains all possess the vagueness of localization, characterizing the ordinary excitation pain.

Iliac Fossa Referred Pain

This, the dominating symptom in a typical case, may be present in both sides of the lower abdomen. Characteristically, however, it is restricted to one side, more commonly the left. The pain distributed in this way exhibits itself: (*a*) as spontaneous pain, (*b*) as local tenderness, and (*c*) as well-localized excitation pain. The *spontaneous pain* may consist of an aching, ever present during the waking hours, or, more commonly, of a pain which comes and goes, being prone to aggravation before

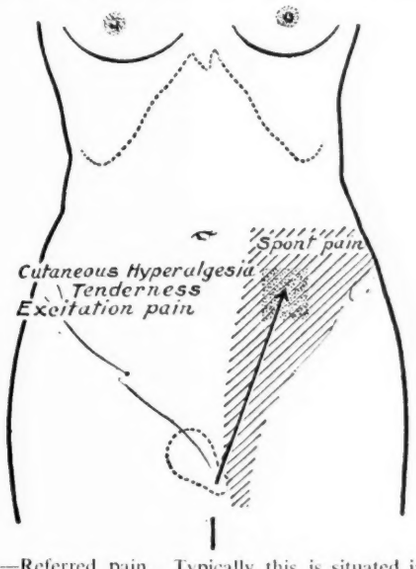

FIG. 2.—Referred pain. Typically this is situated in one or both sides of the lower abdomen. Where unilateral it is more often on the left side. It is present as (*a*) spontaneous pain, (*b*) cutaneous hyperalgesia and deep tenderness, and (*c*) excitation pain. Deviation of the cervix to side of pain is common.

menstruation and during exertion. It may be widely spread over the lower lateral quadrant or it may be more localized. It is associated with *local tenderness*, often over a smaller area, which is usually easy to delimit. In many instances it is restricted to a segment about two inches square lying below and external to the umbilicus. There is generally an associated hyperalgesia of the skin, but muscular rigidity is typically absent. A further observation almost invariably made is that where this referred

segment of spontaneous pain and local tenderness exists pressure on the cervix at once excites pain in an acute and well-localized form in the same area. To this phenomenon I have applied the term *referred excitation pain* (Fig. 2). Excitation pain of this kind is more frequently encountered than the visceral type already described, and it constitutes the main manifestation of the dyspareunia complained of by the majority of such women.

Data Obtained from the Effects of Treatment

Local Treatment.—Before proceeding to a further discussion of this problem it is necessary to interpolate some data derived from the results of treatment directed to the cervical lesion. In a previous communication (Young, 1930) I reported a follow-up of sixty-seven cases over a period varying from two to twelve months subsequent to the routine treatment which we adopt in such cases—namely, dilatation of the cervix, radial incision of the infected area with the electric cautery, and deep puncture of the tissues, including evacuation of the gland cysts which are found in a large proportion of the cases. In thirty-three, or 49 per cent., there was complete relief of pain, whilst in twenty-one, or 31 per cent., there was partial relief. Including a further series of 116 cases we now have records of 183 cases unassociated with any other recognizable lesion, showing after this simple procedure a cure of pain in eighty-five, or 46.4 per cent., and cure or partial relief of varying degree in a total of about 80 per cent. In a number of the partial or complete failures a repeat operation effects entire clinical recovery.

Blockage of Pelvic Nerves.—Despite the good results of these measures, a considerable proportion obtain little or no relief, and in 1932 (Young, 1933) I introduced for this class of case a method aiming at blockage of Frankenhäuser's plexus by an injection into the base of the broad ligament along the side of the cervix of 5 to 10 c.cm. of 85 per cent. alcohol, after the procedure adopted successfully for the treatment of trigeminal neuralgia. In the preliminary communication published in 1933 I recorded eight cases so treated, with relief in seven. Since then I have employed this method in forty-eight cases, with complete immediate relief in forty-one—that is, with a percentage success over both series of 85.7. In my preliminary paper I noted—and this has been borne out in the larger series—that the relief so obtained often only lasts for two or three months, and that for these cases repetition of the procedure is necessary. Recently, however, Sutherland (1937) has employed proctocaine (benzyl alcohol 5 per cent., butyl-*p*-aminobenzoate 6 per cent., olive oil to 100 per cent.) as a substitute for alcohol, and claims complete relief maintained over the period studied (three to twenty months) in twenty-six out of fifty cases, or 52 per cent., and partial benefit and cure in 42, or 84 per cent. For the last six months this procedure has been adopted in my clinic, and although the period is too short to allow of a conclusive statement I have gathered the impression that the method is an improvement on that in which alcohol is used. In parenthesis I would here state that in order to give the patient reporting for the first time the maximum chance of relief it is now my custom to employ a regime in which the treatment directed to cervical drainage is combined with nerve blockage.

The relief conferred by the procedures just mentioned is not restricted to the alleviation of the pains which we have described as characterizing the majority of the cases. Apart from the improvement in the general health and well-being of the patients, which is often rapid and striking, there is in an otherwise successful case usually an immediate relief in the *bladder irritability*, often a distressing element in the syndrome. In the majority of instances this is unassociated with any abnormal constituents in the urine or any evidence of organic lesion in the urinary tract. Within a relatively few hours after the cervical drainage and the nerve blockage the urinary symptoms (diurnal and nocturnal frequency and occasionally dysuria) clear up. It would seem legitimate to assume that these functional disturbances are dependent upon nerve irritation. In some instances there is, in addition, pain related to the bowel and associated with defaecation; in such cases excitation pain may be referred to the back passage. Relief in these respects is also usual.

From what has been said it will have become apparent that there is a small group comprising those who fail to respond to any of the therapeutic measures which we have so far been able to devise, and there is a considerable group of patients in whom the response is only temporary. These groups at the moment are the subject of special study. In some instances relief may be obtained by hysterectomy, although this is by no means certain: out of five such cases the pain persisted in two. Presacral neurectomy, as practised by Cotte (1928) for intractable pelvic pain, fails to give relief in this condition (Young, 1933). Of course in the recalcitrant case a possible error in diagnosis must not be overlooked; this aspect of the subject I shall consider on a subsequent page.

Anatomical Basis of the Visceral and Referred Pains

Visceral Pain.—The mesial and low situation of this pain (corresponding to the twelfth dorsal and first lumbar nerves), its poor localization, and its freedom from any accompanying local tenderness, taken in conjunction with the method in which it is evoked by excitation, all strongly suggest that it arises in the cervix or immediately adjacent tissues. While its actual genesis cannot be established with certainty, the readiness with which it responds to procedures directed to blockage of the nerves at the side of the cervix is in keeping with the view that the nerve stimuli pass upwards along Frankenhäuser's plexus (the inferior hypogastric plexus), the rich bundle of sympathetic fibres which on each side form the downward extension of the superior hypogastric plexus or so-called presacral nerve. These plexuses reach the cervix on each side after encircling the ampulla of the rectum.

Referred Pain.—The relatively high situation of this pain (corresponding in a typical case to the tenth, eleventh, and twelfth dorsal segments), its more or less precise localization in the side of the abdomen, and its associated hyperalgesia and local tenderness, all by analogy strongly suggest that it is not directly visceral in origin and that it should be classed among the referred pains, which in other sites are peritoneal in their genesis. In the absence of reliable data it is impossible to ascribe to them an accurate pelvic source, but the circumstances underlying their easy excitation by cervical pressure are in keeping with the view that they arise from irritation extending beyond the confines of the cervix to the adjacent peritoneum of the pouch of Douglas or broad ligament. In Fig. 3 I have, in diagram, represented the speculative source of the (A) visceral and (B) referred pains. According to such a conception we must assume that the nerve blockage succeeds because it includes the fibres supplying both irritable foci—cervical and peritoneal.

That the visceral and referred pains have such a separate and distinct anatomical basis is supported by two further observations: (i) one pain may exist without the other, and (ii) the procedures directed to nerve blockage may on occasion exert a differential selection in

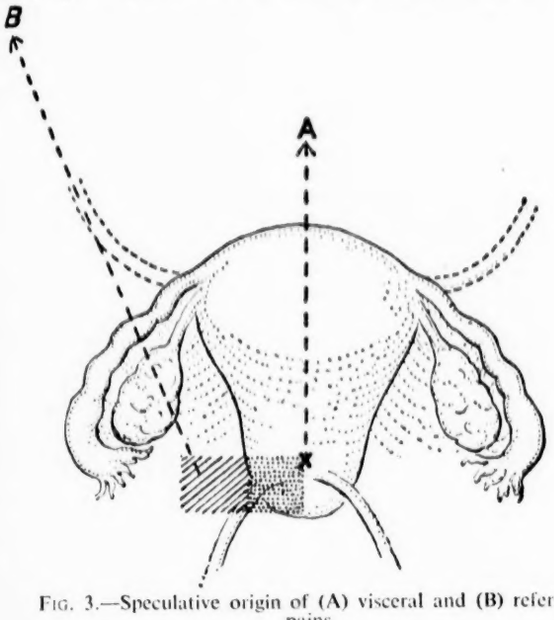

FIG. 3.—Speculative origin of (A) visceral and (B) referred pains.

respect of the two pain phenomena. Thus it sometimes happens that complete relief in one set of pain phenomena is obtained without the other being affected: infiltration of one side with procaine may abolish the referred pain in the corresponding iliac fossa and leave the visceral pain unaffected till similar blockage of the opposite side is carried out.

Low Back Pain

Pain in the lumbo-sacral area is commonly present in women who exhibit the abdominal pain syndrome. Where the symptoms show the puerperal correlation the backache may either date from the latter months of pregnancy or, more commonly, it may only appear after—sometimes some weeks or months after—childbirth. The factors responsible for the common backache of parous women are still obscure, and the wider issues of the subject are not germane to the present discussion. Suffice it to say that from a somewhat confusing symptomatology we can assemble with a degree of precision three more or less definite and distinct clinical conditions: (*a*) backache directly due to genital prolapse and major pelvic disease, which in each case responds to the appropriate treatment; (*b*) backache which is orthopaedic in origin and due to involvement of the sacro-iliac or lumbo-sacral joints (cases with a puerperal correlation are often immediately relieved by manipulation—forcible flexion and extension of the spine and rotation at the sacro-iliac joints); and (*c*) cases that are associated on the one hand with no evidence of joint pathology, and on the other with no pelvic disease except the lesion which has been discussed on the preceding pages. Here excitation pain, poorly localized and referred to the corresponding area in the back, is typically found, and dyspareunia is usually a prominent clinical feature. In such cases blockage of the pelvic nerves is generally successful.

Cases Illustrating the Effects of Nerve Blockage

In the following short clinical records the method which we have latterly introduced for the routine treatment of our cases is made clearer than is possible in the text. The employment of procaine as a routine procedure enables one to determine the extent to which relief may be expected in any individual case by the placing of the proctocaine. It provides at the same time a valuable method of studying the nature and response of the various elements in the pain complex.

CASE I

A 3-para, aged 29, whose last pregnancy ended in miscarriage five years ago.

Complaint.—Leucorrhoea, five years; pain in the left iliac fossa, aggravated pre-menstrually, five years; dyspareunia, five years; frequency of micturition, diurnal and nocturnal.

Examination and Treatment.—October 26, 1937, 10 a.m.: There was no tenderness in the abdomen. The cervix was infected and was mobile; excitation pain was present in the low mesial abdomen, poorly localized. 10.17 a.m.: 10 c.cm. 1 per cent. procaine, left side. 10.20 a.m.: 10 c.cm. 1 per cent. procaine, right side. 10.27 a.m.: Excitation pain gone. 10.40 a.m.: 10 c.cm. proctocaine, both sides. 10.43 a.m.: cauterization of cervix and puncture of Nabothian follicles. November 1, 10.30 a.m.: Excitation pain gone; discharged from hospital. December 23: No spontaneous or excitation pain; dyspareunia, frequency, and leucorrhoea completely relieved.

CASE II

A 2-para, aged 55; last pregnancy eighteen years ago; menopause four years ago.

Complaint.—Leucorrhoea, thick and yellow, one year; pain in left iliac fossa, constant and marked, one year; pain in low back, three months; dysuria and urgency; severe constipation with marked dyspeptic symptoms, pain on movement of bowels; health depreciating, loss of weight, fainting attacks.

December 17, 1936: *X*-ray investigation to exclude bowel neoplasm—negative; no *x*-ray evidence of abnormality in spine or pelvic joints. December 24: Physician diagnosed "spastic constipation." January 2, 1937: Surgeon found no trouble in sacro-iliac or lumbo-sacral joints: "Redundancy in rectal mucosa three inches from anus. Area acutely tender. In view of the negative *x*-ray and laboratory findings I think this is part of an abdominal hypersensitiveness associated with her enteroptotic condition. Her caecum and ascending colon to-day are hyperresonant and the liver dullness is reduced."

Examination and Treatment.—January 10, 1937, 10 a.m.: Spontaneous pain, diffuse over lower abdomen, marked in left iliac fossa; tenderness and superficial hyperalgesia in iliac fossae—marked in left; excitation pain very marked in left iliac fossa. 10.15 a.m.: Endocervical polypus removed; 10 c.cm. 85 per cent. alcohol on each side. January 11: No spontaneous pain, no local tenderness, no excitation pain, no pain on movement of bowels; discharged from hospital.

January 20: As above; general condition very much improved. February 2 to 9: Readmitted because of swelling of left ankle; abdominal condition satisfactory. March 24: Pain in right and left iliac fossae; tenderness and excitation pain have recurred. June 2: Diffuse lower abdominal spontaneous pain, especially in left iliac fossa and extending downwards on inner aspect of left thigh; marked cutaneous hyperalgesia and tenderness in both iliac fossae, especially left; excitation pain in left iliac fossa. June 4: Cervix healthy; proctocaine, 10 c.cm. left side, 5 c.cm. right side. June 6: Spontaneous pain, tenderness, and excitation pain gone. September 15: Feels well; putting on weight; constipation still severe; slight pain in lower abdomen. October 6: Pains and aches have recurred as bad as ever. October 16, 9 a.m.: Spontaneous pain diffuse lower abdomen; cutaneous hyperalgesia and tenderness in both iliac fossae, especially left; excitation pain in left iliac fossa. 9.15 a.m.: 10 c.cm. 1 per cent. procaine, left side. 9.25 a.m.: Tenderness and excitation pain unrelieved; 10 c.cm. 1 per cent. procaine, right side. 9.28 a.m.: Tenderness right side gone, tenderness left side unrelieved; excitation pain unrelieved. 9.35 a.m.: 6 c.cm.

more of procaine, left side. 9.40 a.m.: All pain and tenderness gone; 8 c.cm. proctocaine each side. October 17, 10 a.m: No pain, slight tenderness left iliac fossa. December 2: No spontaneous pain, tenderness, or excitation pain; dysuria and frequency completely relieved; general condition much improved.

CASE III

This patient, aged 22, had her first child one year ago; spontaneous birth.

Complaint.—Leucorrhoea, copious and offensive, one year; pain over sacral area of back, nine months; dyspareunia, nine months; tired, loss of energy—formerly well and vigorous.

Examination.—Nothing abnormal was seen in the abdomen, and there was no local tenderness in the back. The cervix was infected, fixed, and markedly retroposed; severe pain was felt "deep down towards the back" on moving the cervix; poor localization.

Treatment.—October 29, 1937, 11.15 a.m.: Severe excitation pain deep in pelvis—badly localized; caused patient to cry out. 11.18 a.m.: Pain on grasping cervix with vulsellum. 11.24 a.m.: 8 c.cm. 1 per cent. procaine, left side. 11.25 a.m.: 8 c.cm. 1 per cent. procaine, right side. 11.32 a.m.: Excitation pain gone. 11.35 a.m.: 10 c.cm. proctocaine, right side. 11.37 a.m., 10 c.cm. proctocaine, left side. 11.40 a.m.: Cauterization of the infected cervix. November 1: No spontaneous pain in back since operation; no excitation pain. December 23: No spontaneous pain, tenderness, or excitation pain; dyspareunia and leucorrhoea completely relieved.

REMARKS ON CASES I, II, AND III

Cases I and III are common examples in young women of the comparatively early and generally easily curable stage, in which drainage of the cervix is often alone sufficient to effect relief. The recognition of the condition at this early stage is important if the patient is to be protected against a long period of suffering, with the production of a far-reaching systemic upset. Case II is an example in an older woman of the more intractable condition in which treatment effects only a temporary relief. Here the problem is more difficult, for while treatment succeeds in curing the active cervical disease, it does not clear up the pain arising in the residual "scars" for more than three months. Major surgical procedures give no assurance of relief, and such cases in the past have tended to bring surgery into disrepute.

General Discussion

The above observations would seem to make it clear that within the ambit of the one syndrome there are two essentially different pain mechanisms. They differ, first, in regard to the site at which the pain is felt in relation to the body surface and, secondly, in regard to the inherent nature of the sensations experienced. The separateness of the two phenomena lends support to the argument of Morley that the visceral and referred pain mechanisms employ different kinds of nerve tracts. Morley has suggested that, while the splanchnic nerves subserve the visceral mechanism, the cerebrospinal nerves are concerned with that of referred pain and tenderness.

To the student of pain genesis these phenomena, as seen in their somewhat crude form by the clinician, open up intriguing lines of investigation. There are surely few fields in medical research in which the anatomist and physiologist can with more signal advantage be ranged alongside the clinician in pursuit of a common end. Among the many problems that await solution there are two which stand out because of their clinical bearing. The first concerns the study of the nervous arc by which the impulses originating directly or indirectly from visceral disease are eventually registered on a somatic surface as pain. In this connexion the experimental work of Pollock and Davis (1935) has already suggested that the arc involved in the referred pain produced by irritation of the diaphragmatic terminals of the phrenic nerve is much more complex than is generally believed. According to these observers the posterior roots, four segments of the cord, the efferent sympathetic fibres, the cervical sympathetic ganglia, and the sensory nerve endings and sensory nerves of the cerebrospinal system are all implicated.

The second problem relates to the intimate meaning of the various subjective reactions. Take for example the two clinical manifestations of the visceral pain—that which is spontaneous and that which is elicited by excitation. In so far as these are both conceived as arising in and being felt in the viscus, although registered at a site depending upon the spinal segment affected, they may be regarded simply as originating from one and the same local factor, which in the case of excitation is merely increased in intensity. In respect of the referred pain complex, on the other hand, the facts do not lend themselves to such an easy theoretical interpretation. Here the pain would seem to be more definitely felt at the site of registration, whether spontaneous or excited or in the form of tenderness. The interpretation of this, the feature which specially distinguishes the referred phenomena, is not affected by the choice we make between the two competing views of the essential mechanism involved—that is, whether we regard the reference to the distant somatic site as merely due to the creation of an irritable focus in the corresponding segment of the cord or whether we postulate a stimulus sent along the segmental arc to the somatic tissues with the production of biochemical changes at the sensory terminals. The existence of superficial hyperalgesia and local tenderness as an ingredient in the referred complex necessarily implies that the tissues at the site of registration enter into the scheme, though it is true that it cannot be argued from this that the spontaneous and excitation pains of necessity also depend upon the same superficial nerves for their appreciation. I have attempted to test this question by observing the effects of local anaesthesia applied to the abdominal wall. In general it is found that while local anaesthesia of the skin alone abolishes superficial hyperalgesia it does not affect the local tenderness or the excitation pain. Anaesthetization of the entire thickness of the abdominal wall from skin to peritoneum, which is necessary for a complete test, has not so far been employed. In any case there would seem to be a distinct difference between the mechanisms of tenderness and excitation, in that while the former implies a lowering of the threshold for pain in response to impulses *previously* discharged from the primary lesion, it is difficult to explain excitation pain at the same distant site except on the basis of a new reflex stimulus which for its appreciation is independent of the threshold mechanism as this is ordinarily understood. In other words, while stimulation of the sensory terminals at the surface site is necessary for the eliciting of the tenderness, there is no evidence that such is necessary for the eliciting of the excitation or, for that matter, of the spontaneous pain. That tenderness and spontaneous pain are dependent upon a continuous flow of stimuli from the primary source is proved by their immediate disappearance after blockage of this source with procaine.

Some Points in Differential Diagnosis

The establishment on a sound basis of this common syndrome enables us, from the varied conditions responsible for chronic abdominal pain in women, at once to

remove a large—I believe the largest—group, which is easily recognized by its well-defined clinical features. It may be claimed with justice to have effected a veritable clearance in a lumber-room of diagnostic confusion. Most of us can recall the days when the chronic abdominal pains which are the subject of this study were ascribed to conditions as unsatisfying to the conscientious clinician as they were ill founded in pathology—for example, varicocele of the pampiniform plexus, sclerotic ovaries, ovaritis, prolapse of the ovary, constipation, adhesions, neurasthenia, etc.

The absence of gross pelvic and abdominal pathology and the puerperal correlation usually suffice at once to distinguish the syndrome from the major causes of lower abdominal pain—neoplasm, endometrioma, diverticulosis, appendicitis, etc. In subacute and chronic salpingitis there may be confusion, especially where the history dates from childbirth or abortion, but the presence of a tender, fixed, often bilateral mass in the posterior pelvis generally establishes the diagnosis. In some few cases the syndrome may be simulated by endometrioma; but here the puerperal correlation is usually absent, and whereas the former is very common in young women endometrioma is more frequent in later years. In endometrioma, moreover, the characteristic tender and fixed mass in the pouch of Douglas is often found. At the same time in women over 30 with a menstrual exacerbation of the pain endometrioma should always be considered. A chronic pelvic appendicitis may sometimes closely simulate the condition, though here again the characteristic puerperal dating is generally absent. It should be remembered that in such conditions as salpingitis, endometrioma, and pelvic appendicitis, where a tender swelling is present low in the pelvis, vaginal excitation pains are usually easily elicited, and therefore they cannot of themselves be regarded as of great value in the relatively rare cases which are in doubt. A common source of clinical confusion is in regard to recurrent appendicitis, and it is notorious that a large number of women with right iliac fossa pain have had their appendix removed before coming to our clinic. It is of the utmost importance that the surgeon should be more familiar with this common source of iliac fossa pain and its diagnosis. The easy establishment of referred excitation pain in the right side and its immediate removal by nerve blockage are the main diagnostic aids.

Finally, it is important to remember that in a large number of gynaecological conditions a serious error in diagnosis may arise from a failure to recognize that iliac fossa pain may spring not from the more apparent pathology, such as retroflexion, genital prolapse, etc., but from the frequently coincident cervical lesion. The institution of treatment appropriate to this lesion may eliminate the indication for more major treatment; where major measures are required the associated syndrome should be dealt with at the same time.

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CULTURAL METHODS IN BACTERIOLOGICAL DIAGNOSIS OF TUBERCULOSIS

BY

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Using the Jensen (1932) modification of the medium introduced by Löwenstein (1930), Holmes (1934) drew attention to the value of cultivation in the diagnosis of tuberculosis. Of the many observations of similar nature may be mentioned those of Hohn (1926), Sweany and Evanoff (1928), Bezançon and Buc (1931), Herrold (1931), Corper (1932), Danbolt (1935), Cummins and Duggan (1934), and Mishulow and others (1934). Shrewsbury and Barson (1937) noted successful results following the introduction of cultivation as part of the routine investigation of selected specimens of sputa. In order to determine the practical value of the method the same procedure has been adopted in this laboratory with all specimens in which an examination for *B. tuberculosis* was requested, and the results obtained over a period of two years are here recorded. Sputa from recognized or clinically suspicious cases of human tuberculosis comprised the bulk of the material examined, which also included specimens of urine, pleural fluid, milk, and cerebrospinal fluid. The previous routine examination was adhered to and the results compared with those secured by the additional aid of cultivation.

Methods

Routine Examination.—The examination of sputa consisted in the usual microscopical examination of films stained by the Ziehl-Neelsen method. The finding of acid-fast and alcohol-fast bacilli morphologically identical with *B. tuberculosis* was reported as a "positive" result, the absence of such forms being reported as "tubercle bacilli not found." The same procedure, preceded if necessary by centrifugation, was adopted with all other specimens save in the case of milk. Guinea-pig inoculation was carried out in specimens other than milk only if special request was made, but in examining milks the animal test was invariably utilized.

Cultural Methods.—If the specimen received was likely to be free of organisms other than tubercle bacilli—for example, cerebrospinal fluid withdrawn at lumbar puncture—the centrifuged deposit of such specimens was directly inoculated on culture media without further treatment. In the presence of contaminating organisms the material was first centrifuged if necessary. The deposit was then suspended in 2 c.cm. of the supernatant fluid, acidified for thirty minutes by the addition of an equal volume of 6 per cent. hydrochloric acid, and neutralized by the addition of 4 per cent. sodium hydroxide. The centrifuged deposit was then inoculated by means of a sterile Pasteur pipette on culture media. In a previous examination of a large number of cerebrospinal fluids and specimens of pus for tubercle bacilli the preliminary acid treatment had been successfully used, and the same procedure was therefore adapted to the examination of sputum instead of the usual alkali method.

The culture media most frequently used were the Löwenstein–Jensen medium and a modification of the same in which the glycerin content was omitted. All specimens were cultured on both media in screw-cap bottles. Considerable economy in incubator space and the easy handling of large numbers of bottle cultures were secured by the use of a rack consisting of a wooden

board, one inch in thickness, drilled with holes just large enough to hold the base of a bottle and fitted with a plywood base. In a rack eight inches by twelve inches were carried forty-eight cultures, the flat surface presented by the tops of the bottles enabling racks to be piled one above the other, while still permitting free passage of air and uniform heating of the cultures. Incubation was continued at 37° C. for four weeks, and all cultures were then examined. Films of suspect cultures were stained by the Ziehl-Neelsen method, and on finding the morphologically typical acid-fast bacilli the pathogenicity of the strain was in many cases confirmed by animal inoculation. The expense involved prohibited the examination of all strains by this method. Random selection of cultures for the test was therefore made, but all strains which showed the slightest variation in cultural characteristics were included in the selection. Cultures from specimens of sputum were tested for virulence in forty-nine (34.5 per cent.) of 142 cases which had been reported as negative in the routine microscopical examination, and in sixty (15 per cent.) of 401 cases in which the direct film report was positive. The pathogenicity of positive cultures from specimens of pleural fluid, pus, urine, cerebrospinal fluid, and milk was thus confirmed. In no instance was a diagnosis based on the morphological and cultural characters of a strain proved erroneous on animal inoculation.

Results

Sputum.—As previously stated, the bulk of the material examined consisted of sputa from tuberculosis dispensaries and those received from practitioners for general bacteriological examination. In Table I are collected the results

TABLE I.—*Results of Examination by Combined Direct Film and Cultural Methods of 3,306 Specimens for B. tuberculosis*

Result		Specimen							Total
Film	Culture	Sputum	Pleural Fluid	Pus	Urine	C.S.F.	Milk	Faeces	
+	+	401	0	4	5	1	2	3	416 (12.5%)
−	+	142	3	5	7	3	5	0	165 (5.0%)
+	−	9	0	4	0	0	2	0	15 (0.4%)
−	−	2,244	57	85	212	19	74	19	2,710 (82.1%)
		2,796	60	98	224	23	83	22	3,306 (100%)

obtained by the combined method. Of 2,796 such specimens 552 (19.7 per cent.) were reported positive by direct film, cultural, or combined examinations. Cultivation alone was successful in 543, or 98.3 per cent. of all positive results obtained. In the remaining nine specimens re-examination confirmed the presence of tubercle bacilli in direct films, but always in scanty numbers. The most significant finding was that only 410, or 74.3 per cent. of all positive results, were detected by the routine film examination. Repeated examination by separate observers confirmed the absence of tubercle bacilli in the original stained smears of the 25.7 per cent. of sputa later proved positive by culture. In such specimens the colonies appearing were often few in number, but not invariably so. Indeed, the rich growth which sometimes occurred was surprising in the face of a negative film report. As indicated in Table II, only five sputa were subjected to guinea-pig inoculation ; all were negative in the triple test.

Pleural Fluid.—No specimen of pleural fluid was found positive by direct microscopical examination, but three were detected by culture. In these the number of colonies appearing on the Löwenstein medium were one, three,

TABLE II.—*Results of Examinations for B. tuberculosis in which Guinea-pig Inoculation and Cultivation were both Utilized*

Specimen	Number	Cultural and Animal Results				
		C+ A+	C− A−	C+ A−	C− A+	C+ Ad
Sputum ..	5	—	5	—	—	—
Urine	17	3	12	1	1	—
Milk	77	4	61	3	9	—
Pleural fluid ..	8	1	6	—	1	—
Pus	4	1	2	—	—	1
C.S.F. ..	3	1	1	—	1	—
Gastric lavage	4	2	—	—	1	1
Totals ..	118	12	87	4	13	2

C = culture ; A = animal inoculation ; + = positive ; — = negative ; d = inoculated animal died before reading possible.

and four respectively, indicating the extreme paucity of the numbers of organisms present. Guinea-pig inoculation succeeded in one instance where direct film and cultural examination failed.

Pus.—Of the thirteen positive specimens of pus, mainly from lymphatic glands, direct film and cultivation failed in five and four respectively. As three of the negative cultural results were from old-standing lesions, the organisms seen in direct films were possibly degenerated or actually dead.

Urine.—Since this laboratory serves as a group laboratory for several municipal hospitals a large number of urines were received for general bacteriological examination. Animal inoculation being reserved for special cases, routine cultivation proved a useful accessory measure, seven of the twelve positive cases being detected by this method. One specimen negative by both film and culture was positive on animal inoculation. Another specimen in which very few organisms were seen in direct films was positive on culture but negative on animal inoculation. In view of this surprising result the pathogenicity of the culture was confirmed by animal inoculation.

Cerebrospinal Fluid.—In the three specimens positive on cultivation only, the colonies appearing were in each instance few in number. Cultivation failed in one specimen positive by the animal test.

Milk.—The preculture treatment outlined above was not successful in eliminating all acid-fast saprophytes such as the timothy grass bacillus. These strains appeared rapidly on culture media, being clearly visible within two or three days, and were thus easily differentiated from strains of bovine tubercle bacilli, which were not apparent for an interval of eighteen days or more. Further, the growths of saprophytic strains were luxuriant as compared with the sparse dysgonic growth of the pathogen. Nine specimens positive on animal inoculation were negative on culture, while three positive cultural results were negative on animal inoculation. The pathogenicity of these latter strains was confirmed by animal inoculation.

Correlation of Bacteriological with Clinical Diagnosis

Although in most cases in human subjects from which specimens had been received there was some clinical justification for the request that an examination for *B. tuberculosis* be carried out, the great increase in positive results obtained by the cultural method made it essential to discover to what extent the bacteriological diagnosis agreed with the results of other methods of examination.

Accordingly a questionary was prepared and sent to clinicians in charge of those cases in which a negative direct film examination was followed by a positive cultural report. Of the fifty-five replies received the bacteriological findings were confirmed in fifty instances by clinical examination, *x* rays, or other means. In twenty-nine cases the clinician was reasonably certain of his diagnosis, but the cultural report served to place the matter beyond all doubt. Illustrative of this type of case are the following.

Case 1.—This man, aged 55, was suspected clinically of having pulmonary tuberculosis of the fibroid type, but repeated tests by direct film examination were invariably negative. The clinician observed that "the positive result in culture revealed an active condition which previously had only been suspected."

Case 2.—A woman aged 22, in whom the clinical diagnosis, supported by *x*-ray examination, indicated pulmonary tuberculosis involving principally the left upper lobe. Direct film examination was negative, but positive culture confirmed the diagnosis.

Case 3.—This patient, a woman aged 56, was diagnosed clinically as having chronic bronchitis. The clinician reported that "the physical signs were always those of chronic bronchitis and obscured any underlying tuberculous findings . . . the positive cultural result was followed by further investigations in hospital," and these confirmed the diagnosis.

Case 4.—In this patient, a man aged 22, an extensive pleural effusion developed on the left side eight months prior to examination of sputum. Repeated examinations of the fluid were negative, but coughing persisted. Direct film examinations of the sputum were negative, but on culture a few colonies of *B. tuberculosis* appeared.

In the next series of twenty cases the bacteriological findings were relatively of much greater importance in that the clinical suspicion of tuberculous infection was slight and the specimen was submitted more for the purpose of exclusion than in the hope of obtaining a positive result. The following are cited as examples of this type.

Case 5.—This patient, a man aged 60, had had a slight cough for years which ceased when cigarette-smoking was curtailed, and was thought to arise from that source. He had a bad family history of tuberculosis, but has always enjoyed fairly good general health. The positive cultural report led to *x*-ray examination, which revealed uniform marked opacity above the right apex with deposits in the left infraclavicular region from the first to the third rib. The only abnormality detected clinically in the chest was a diminution in breath sounds over the upper part of the left lung.

Case 6.—A man aged 39; he was considered to have entirely recovered from pulmonary tuberculosis, and had returned to work as a shop assistant. His doctor advised him to report periodically for examination, and a specimen of sputum taken at one of these visits was negative by direct examination but positive on culture. Physical examination revealed no signs of active infection.

Case 7.—A married woman aged 41. She complained of a feeling of weakness and loss of energy; physical examination was entirely negative. *X*-ray examination, following the receipt of a positive cultural report, revealed a right basal pleurisy and light fibrotic disease of right apex. Sanatorium treatment for six months, concluded with a further *x*-ray examination, which showed that the pleurisy had cleared up and the right apical lesion had apparently healed.

Among this latter group of cases were several in which the infection was almost certainly of very recent standing.

Case 8.—A typist, aged 30. This patient had had a slight haemoptysis, but otherwise she felt well. Clinically there was nothing further suggestive of active infection, but *x*-ray examination on the receipt of a positive cultural report indicated a lesion in the left apex. After sanatorium treatment the patient recovered satisfactorily and returned to work.

Case 9.—A male, aged 32, employed as an able seaman, complained of haemoptysis. Clinically he appeared fit and was able to carry out his duties without difficulty. *X*-ray examination following a cultural report indicated a lesion in the left apex. In this instance the diagnosis was of importance as regards pension adjustments, etc., but an observation period in a sanatorium fully confirmed the diagnosis.

Case 10.—A baby boy, aged 11 months, had attacks of mild pyrexia at intervals over three weeks, which were followed by signs of consolidation at the left apex. The mother was known to be tuberculous, the family history being altogether bad. The patient was found to react positively to the Mantoux test, the concentration of tuberculin used being 1 in 100,000. In this instance the culture was of the human type.

In all the above cases the cultures were derived from sputa, but the organism has also been unexpectedly demonstrated in other situations by this method.

Case 11.—A boy aged 13 complained of prepatellar bursitis of left knee. This condition had persisted for months, to a great extent varying with his general health. On account of a bad family history, a specimen of pus aspirated from the lesion was submitted for examination. No growth appeared on blood agar and no organisms were found on direct films, but tubercle bacilli were isolated on culture.

CASES WITH LESIONS OTHER THAN TUBERCULOUS

In the remaining six cases there were lesions other than those of tuberculous infection to which the patients' symptoms were attributed by the clinician in charge. The possibility that tuberculous infection was also present, however, could not be entirely discounted in any of these cases, the details being as follows.

Case 12.—A married woman aged 39 complained of frequent head colds, with subsequent irritable cough, for four years, dating from childbirth. She was ambulant, but always appeared unwell. Clinically and radiologically there was no evidence of tuberculous infection, but tubercle bacilli were isolated on culture from sputum.

Case 13.—A woman aged 40 was admitted to hospital with "meningitis of doubtful origin," later considered to be cerebrospinal meningitis on clinical grounds and on the isolation of meningococci from cerebrospinal fluid in the hospital laboratory. A specimen of fluid submitted to this laboratory for verification was found to show no organisms in direct films and no growth on blood agar, but tubercle bacilli were isolated on culture. The patient recovered without further developments and was discharged apparently well.

Case 14.—A man aged 63 was admitted to hospital as a case of congestive heart failure. Clinically there was no evidence of tuberculosis, although *x*-ray examination revealed a gross right basal lesion, probably encysted fluid. On culture tubercle bacilli were isolated from sputum.

Case 15.—A married woman was diagnosed clinically as suffering from severe bronchitis complicated by pyelitis. Ordinary physical examination revealed no sign of tuberculous disease of the lungs, and the bronchitis cleared completely following recovery from pyelitis. No *x*-ray examination was made. Culture of the sputum for tubercle bacilli was successful.

Case 16.—A married woman aged 32 was under observation for pulmonary tuberculosis, but no evidence was obtained other than the isolation of tubercle bacilli from a specimen of sputum. There appeared to be considerable doubt as to the diagnosis in this case, as *x*-ray examination carried out four years previously was negative but had not been repeated. The possibility of a right apical lesion was not entirely ruled out.

Case 17.—This male patient complained of symptoms indicative of an intrathoracic lesion on the left side. The sputum was blood-stained, but showed no tubercle bacilli in direct films, although a growth of this organism was present on

culture. The *x*-ray appearances suggested a neoplasm of the lung. The patient died in hospital, but permission for a post-mortem examination was not obtained.

Discussion

The results of this investigation over a period of two years have justified a cultivation test in the routine examination for *B. tuberculosis*. The adoption of cultivation lengthens the examination considerably, and on this account careful choice should be made of the material subjected to the treatment. This entails the co-operation of clinicians, particularly in the case of laboratories dealing with large numbers of specimens from hospital sources. Much of the time and energy now expended on multiple routine examinations, often demanded without real justification, could be profitably devoted to a more prolonged investigation of a smaller number of likely cases.

The results of sputum examination were especially significant. Animal inoculations of all such specimens is rarely possible or even practicable, and in the absence of this test cultivation affords a very satisfactory substitute. In this series cultivation yielded an increase of 32.4 per cent. of positives over the direct film result. There is the possibility that multiple film examinations may have been more successful than the use of a single film, but it is extremely doubtful if the results secured by cultural methods could have been attained. That direct film examination is not sufficient has been indicated by Jamieson (1936), who found cultivation successful in 100 sputa from 100 known cases of phthisis, whereas repeated examinations of direct films were positive in but ninety-two cases. It is an additional advantage, moreover, in doubtful clinical cases, that the pathogenicity of the organism isolated from sputum can be confirmed if necessary. The routine procedure now adopted in this laboratory as regards sputum examinations is to report positive film results as before. In the case of negative results there is added a note that culture is being attempted and will be reported later if positive.

But the efficiency of the test cannot be gauged merely by the increased number of positive results which it yields. There must be confirmation of the bacteriological findings by other methods. That confirmation has been amply obtained, as the majority of the cases giving negative direct film but positive cultural results, and for which clinical data were available, were unquestionably infected subjects. All stages of infection have been detected in this way. In a very small number of subjects there was not, in the clinician's opinion, much ground for supporting the bacteriological diagnosis, but the possibility of this being correct could in no case be excluded. When one remembers the prevalence of subclinical infection as indicated by post-mortem examinations, tuberculin testing, and other methods, it is not surprising that cases of this nature will be discovered by the cultural method. But the delicacy of the test calls for great care in the taking of specimens for examination, particularly in cases where the possibility of contamination with tuberculous secretions is present—as, for instance, the investigation of family contacts by the examination of sputa. Precautions must be made to ensure that only the subject's secretions and not those of a relative reach the specimen container. The method appears to be of value even in the early stages of infection, and may possibly be applied to detect an initial infection in childhood. Case 10 may prove to be an instance of this, as the child is now progressing satisfactorily. It may be stated here that there was no doubt that the growth was derived from the child's own secretions and was of the human type. Shrewsbury has raised the point that the method may be applied to the detection of "carriers" of tubercle bacilli. While on account of the existing lack of information this possibility cannot be denied, it is more than likely that the so-called "carrier" is a person with a focus which defies clinical demonstration during life. Such cases can only be demonstrated by cultural or animal inoculation methods, so that the ultimate issue remains as before—namely, the possible detection of a hidden source of infection. One further point on which the method will furnish reliable information is the incidence of the two types of tubercle bacillus in human infections.

While not so striking on account of the smaller number dealt with, the usefulness of cultivation was also indicated in the examination of specimens other than sputa. At the present time, however, cultivation cannot entirely replace animal inoculation, particularly in specimens in which there is a possibility of the bovine type of organism existing in small numbers. Feldman (1934) after an investigation of similar nature came to the same conclusion. Animal inoculation cannot, however, be regarded as infallible, and in Table II appear four instances in which animal inoculation proved negative, whereas cultures from the same inoculum were positive. Examples of this type of result have been recorded by Woolsey (1931). The results of animal inoculation and of cultivation (Table II) were the same in ninety-nine specimens and different in nineteen. Of these nineteen, animal inoculation was most frequently positive (thirteen), while cultivation was successful in four specimens which were negative in animals and two specimens in which inoculated animals died before a report was permissible. The optimum results, then, can only be secured in the investigation of such material by the utilization of both methods of examination.

Conclusions

1. Cultivation is a practicable measure in the routine examination for *B. tuberculosis*.

2. In a series of 3,306 specimens of all types, mainly sputa, the percentage of positives was 12.9 by direct film and 17.9 by the combined film and cultural examinations.

3. While animal inoculation is in most cases more reliable than cultivation, it is not invariably so.

It is with pleasure that I acknowledge the assistance and willing co-operation of the laboratory technical staff. Without their help and in particular that of Mr. R. K. Farmer, such a large number of specimens could not have been handled. I am indebted to Professor T. J. Mackie for his interest in the work and the granting of various facilities. To all practitioners who supplied clinical data my thanks are due, for their information added a very real interest to the investigation.

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TREATMENT OF STREPTOCOCCAL EMPYEMA WITH INTRAPLEURAL SULPHANILAMIDE

EXPERIMENTAL STUDY IN RABBITS

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Methods

Rabbits were used in this work, for it is not difficult to infect them with a human strain of haemolytic streptococcus and pleural puncture is fairly simple in animals of this size. A haemolytic streptococcus isolated from a fatal case of septicaemia occurring in the hospital was passed successively through ten rabbits in order to increase its virulence for them. Equal doses of a broth culture of the organism recovered from the tenth rabbit were injected into the right pleural cavities of a series of rabbits of approximately equal weights. In one case the injection resulted in immediate death from haemorrhage, due to puncture of a blood vessel. The animals of the test series received regular doses of soluble prontosil by direct injection into the right pleural cavity, and an effort was made to remove a volume of fluid from the pleural cavity equal to the volume of prontosil to be injected, so that the intrapleural pressure was disturbed as little as possible. This was not always easy in practice. The drug was the 2.5 per cent. solution of prontosil. Hörlein (1935) has demonstrated that rabbits tolerate 50 c.cm. of this solution intravenously per kilogramme of body weight; but the largest dose used in these investigations was 10 c.cm., and this was found too large, for reasons suggested later. The control animals received the infecting dose of streptococci, but no treatment. Complete necropsies were performed, cultures being taken from the pleural cavity and the presence of prontosil in other organs observed.

Results

The first ten animals gave the results tabulated in Table I, which includes one other animal which died on being injected. Note the early deaths in the treated group, compared with the controls. In two cases in the test group there was a very marked shift of the mediastinum to the left, the right pleural cavity being filled with prontosil-coloured fluid. The pus in the test animals was thinner than in the controls, but this was probably due to their early death during the formative stage of the empyema. Although, as already stated, 10 c.cm. of 2.5 per cent. solution of prontosil is well within the tolerated dose for rabbits—these rabbits weighing on an average 1.2 kg.—it became apparent that 10 c.cm. as a single intrapleural dose may cause considerable changes in intrapleural pressure; therefore in the next series of animals the dose was reduced.

In the second series (Table II) the four controls received streptococci into the pleural cavity; four test animals received 2 c.cm. of prontosil into the pleural cavity twenty-four hours after it had been infected, and subsequent doses of the drug as shown; four more were not infected, but prontosil alone was injected into the virgin pleural cavity. One animal in this last group died of septicaemia, probably having been infected by its cage-mates. The animals in this series survived long enough to develop thick pus in the pleural cavity, and in only one case was there much of a mediastinal shift.

In the third series (Table III) four rabbits were inoculated with streptococci and prontosil at the same time; four were infected and the prontosil immediately given into the muscles; four were controls with no therapy. A decrease in virulence is shown in the last group.

In the fourth series (Table IV) two received prontosil alone, two streptococci. Four were inoculated with streptococci, and prontosil was given by the intramuscular route. Into the last four both streptococci and prontosil were injected simultaneously into the pleural cavity. The organism shows a marked decrease in virulence, most of the animals being killed after ten days, but the last group of four shows the greatest mortality, three of them dying of the disease with a positive pleural culture.

Two facts are apparent: first, that the animals which were given prontosil into the pleural cavity died earlier than those animals from which it was withheld; secondly, that the former more often had a positive culture returned from the swab of the pleural cavity. Some of the test animals died from effects due to changes in intrapleural pressure, but this did not account for all of them. Prontosil injected into the virgin pleural cavity did not appear to damage the tissues grossly, although it may have reduced local resistance in one case. Intramuscular injection of prontosil gave better results than its injection into the pleural cavity. No renal or hepatic lesions due to the prontosil were found.

Discussion

Sulphanilamide has so rapidly become a universal remedy that it is important to study its action in controlled experiments as much as possible. Most of this sort of work has been carried out in mice, the peritoneum being infected and the drug given by mouth or intramuscularly (Domagk, 1935; Levaditi and Vaisman, 1935; Colebrook and Kenny, 1936; Long and Bliss, 1937; Mellon, Gross, and Cooper, 1937). The action of sulphanilamide has also been studied *in vitro*, but experimental empyema does not appear to have been investigated. The increasing frequency of clinical cures of streptococcal empyema reported (Brown, 1937), where the method of treatment has been the direct injection of prontosil into the pleural cavity associated with daily aspiration of pus, makes it desirable to try a similar experiment in animals. Only the successes appear in clinical reports, and the cases rarely exceed two or three. As is well known, streptococcal infections are notoriously variable in virulence, and cases of streptococcal empyema sometimes resolved with simple aspiration long before prontosil was introduced. The cases reported in which prontosil had been used are those in which thick pus was present at the first aspiration. This in itself shows that the dangerous stage of the disease has already been passed, and the injection of prontosil may have had little to do with the subsequent thinning of the pus and disappearance of the organisms. The time when the drug is most indicated is, of course, at the onset of the infection, when the pneumonia is active but the empyema is only in its formative stage. It is then more logical to give the drug by mouth, intramuscularly, or intravenously. Good results are also obtained in the later stages of the empyema by the oral administration of the drug, according to several reporters (Melnotte and Briquel, 1936). When this work was started it was hoped that perhaps prontosil might prove to be bacteriostatic when injected into the pleural cavity simultaneously with streptococci. If this had been proved its use in combating the virulent

TABLE I

(M = Mors ; P = Prontosil ; pl = into pleural cavity ; m = intramuscularly ; h.str. = haemolytic streptococci.)

Rabbit	Days: 0	1	2	3	4	5	6	7	8	9	10	Over 10	Pleural Fluid, Culture	Mediastinum	Prontosil. Where Found	Other Organs	Cause of Death
11	h.str.	10 c.cm. P pl	M										Thin Negative	—	Both pleurae and bladder	—	Pneumonia
12	,, M												Died immediately of haemorrhage				
13	h.str.	,,	10 c.cm. pl	M									Thin, excessive Positive	Shift to left	R. pleura and bladder		Mediastinal shift
14	,,	,,	,,	10 c.cm. pl	—	M							None Negative	—	Muscle and bladder	—	?
15	,,	,,	,,	,,	—	M							Turbid, excessive Positive	Shift to left	R. pleura and bladder	—	Mediastinal shift
16	,,	,,	,,	,,	—	M							Thick pus, adhesions Positive	—	—	Pericard-itis	Pericarditis and empyema
17	h.str.	—	—	—	—	—	—	—	—	—	—	M 12	Thick pus Positive	—	—	—	Empyema
18	,,	—	—	—	—	—	—	M					Thick pus Positive	—	—	Pericard-itis	Empyema and pericarditis
19	,,	—	—	M									Thick pus Positive	—	—	,,	,,
20	,,	—	—	—	—	—	—	—	—	—	M		Thick pus Positive	—	—	,,	,,
21	,,	—	—	—	—	—	—	—	—	—	—	M 23	No lesion Negative	—	—	—	?

TABLE II

Rabbit	Days: 0	1	2	3	4	5	6	7	8	9	10	Over 10	Pleural Fluid, Culture	Mediastinum	Prontosil. Where Found	Other Organs	Cause of Death
22	h.str.	M											No necropsy				
23	,,	—	—	—	M								Thick pus Positive	—	—	Pericard-itis	Pericarditis
24	,,	—	—	—	—	M							Thick pus Positive	—	—	,,	,,
25	,,	—	—	—	—	—	—	—	—	M			Thick pus Negative	—	—	Effusion on left Pericard-itis	,,
26	h.str.	2 c.cm. P pl	2 c.cm. P pl	—	M								Thick pus Positive	—	R. pleura and bladder	Pericard-itis	Pericarditis
27	,,	,,	,,	—	5 c.cm. P pl	2 c.cm. P pl	M						Thick pus Positive	—	Bladder	Subcu-taneous abscess	Empyema
28	,,	,,	,,	—	M								Thick pus Positive	—	Bladder	—	,,
29	,,	,,	,,	—	5 c.cm. P pl	2 c.cm. P pl	2 c.cm. P pl	2 c.cm. P pl	2 c.cm. P pl	2 c.cm. P pl	M		Thick pus Negative	Shift to left	Bladder	Both lungs collapsed	Mediastinal shift
30	2 c.cm. P pl	2 c.cm. P pl	2 c.cm. P pl	—	5 c.cm. P pl	2 c.cm. P pl	M						A little fluid Negative	Slight shift to left	Bladder	—	Mediastinal shift
31	,,	,,	,,	—	,,	,,	2 c.cm. P pl	2 c.cm. P pl	M				No fluid Pneumo-thorax Negative	Shift to left	—	Both lungs collapsed	Mediastinal shift
32	,,	,,	,,	—	,,	,,	,,	,,	M				A little fluid Positive	—	—	Pneu-monia R. and L. Pyaemic abscesses	Septicaemia
33	,,	,,	,,	—	,,	,,	,,	,,	2 c.cm. P pl	2 c.cm. P pl	2 c.cm. P pl	M 11	No lesion Negative	—	—	Sterile abscess in muscle Negative	?

streptococcal empyema which sometimes complicates lobectomy would have been worth a clinical trial. But it appears to have no such action. This is in part explained by the recent work of Finklestone-Sayliss, Paine, and Patrick (1937), who have shown that sulphanilamide actually stimulates streptococci to multiply in the early stages of treatment, this effect being especially evident in young cultures. Later its bacteriostatic effect exerts itself. The danger of introducing prontosil into the pleural cavity may in part be due to this effect, in that the organisms multiply and reach the general circulation, whereas the drug is absorbed with increasing difficulty as the empyema develops. In the present state of our knowledge it seems to be advisable to avoid the intrapleural injection of prontosil in cases of streptococcal empyema, but rather to give prontylin by mouth, or, if the drug is introduced by way of the pleural cavity, it should certainly be combined with the oral administration of prontylin. Naturally there is considerable difference between empyema in rabbits and that in man, but the dissimilarity can hardly be greater than the normal variation in virulence of human streptococcal infections, so that the results seen in the rabbits are not without their clinical interest.

Summarizing the results of the tables we find that fifteen animals, untreated, survived an average of 7.5 days each, and that the pleural fluid gave positive haemolytic

TABLE III

Rabbit	Days: 0	1	2	3	4	5	6	7	8	9	10	Over 10	Pleural Fluid, Culture	Mediastinum	Prontosil. Where Found	Other Organs	Cause of Death
34	h.str. 5 c.cm. P pl	2 c.cm. P pl	2 c.cm. P pl	2 c.cm. P pl	M								Thin pus Positive	Shift to left	R. pleura and bladder	L. lung collapsed	Mediastinal shift
35	,,	,,	,,	,,	2 c.cm. P pl	2 c.cm. P pl	—	M					Thick pus Positive	—	,,	—	Empyema
36	,,	,,	M										Thin pus Negative	Slight shift to left	R. pleura	L. lung collapsed	Mediastinal shift
37	,,	,,	2 c.cm. P pl	,,	,,	,,	—	2 c.cm. P pl	M				Thin pus Positive	—	R. pleura and bladder	Pyaemic abscesses	Septicaemia
38	h.str. 5 c.cm. P m	2 c.cm. P m	2 c.cm. P m	2 c.cm. P m	2 c.cm. P m	2 c.cm. P m	—	2 c.cm. P m	—	—	2 c.cm. P m	M 12	Thin pus Positive	Shift to left	—	Pyaemic abscesses	Septicaemia
39	,,	,,	,,	,,	,,	,,	M						Thick pus Positive	—	Bladder	—	Empyema
40	,,	,,	,,	M									No lesion Negative	—	—	—	?
41	,,	,,	,,	2 c.cm. P m	,,	M							No fluid Negative	—	—	R. pneumonia	Pneumonia
42	h.str.	—	—	—	—	—	—	—	—	—	M		No fluid Pneumothorax Negative	—	—	Blood culture Negative	?
43	,,	—	—	—	—	—	M						No fluid Negative	—	—	Abscess in muscle Pyaemic abscesses Positive	Septicaemia
44	,,	—	—	M									No fluid Negative	—	—	Blood culture Negative	?
45	,,	—	—	M									Thin pus Positive	—	—	—	Empyema

TABLE IV

Rabbit	Days: 0	1	2	3	4	5	6	7	8	9	10	Over 10	Pleural Fluid, Culture	Mediastinum	Prontosil. Where Found	Other Organs	Cause of Death
46	2 c.cm. P pl	2 c.cm. P pl	—	2 c.cm. P pl	—	2 c.cm. P pl	2 c.cm. P pl	—	2 c.cm. P pl	—	—	K.11	No lesion Negative	—	—	—	Killed
47	,,	,,	—	,,	—	,,	,,	—	,,	—	—	K.11	No lesion Negative	—	—		Killed
48	h.str.	—	—	—	—	—	—	M					No fluid Negative	—	—	Pyaemic abscesses Positive	Septicaemia
49	h.str.	—	—	—	—	—	—	—	—	—	—	K.11	No lesion Negative	—	—	—	Killed
50	2 c.cm. P m h.str.	2 c.cm. P m	—	2 c.cm. P m	—	2 c.cm. P m	2 c.cm. P m	—	2 c.cm. P m	—	—	K.11	R. pneumothorax Negative	—	—	—	Killed
51	,,	,,	—	,,	—	,,	,,	M					Thin pus Positive	—	—	—	Empyema
52	,,	,,	—	,,	—	,,	,,	—	,,	—	—	K.11	No lesion Negative	—	—	—	Killed
53	,,	,,	—	,,	—	,,	,,	—	,,	—	—	K.11	Thin pus Negative	Shift to left	—	—	Killed
54	h.str. 2 c.cm. P pl	2 c.cm. P pl	—	2 c.cm. P pl	—	2 c.cm. P pl	M						Thin pus Positive	—	—	Pericarditis	Pericarditis
55	,,	,,	—	,,	M								Thin fluid Positive	—	R. pleura and bladder	Pneumonia	Pneumonia
56	,,	,,	—	,,	—	,,	M						Thin fluid Pneumothorax Positive	Shift to left	R. pleura	L. lung collapsed	Mediastinal shift
57	,,	,,	—	,,	—	,,	2 c.cm. P pl	—	2 c.cm. P pl	—	—	K.11	Thick pus Negative	—	—	—	Killed

streptococcus culture in 53 per cent. Seventeen animals treated with intrapleural prontosil survived an average of 5.7 days, the pleural fluid giving positive haemolytic streptococcus culture in 70 per cent. Eight animals treated with intramuscular prontosil survived an average of 7.8 days, with a positive haemolytic streptococcus culture in 37 per cent.

Summary

1. The direct effect of prontosil on streptococcal empyema has been studied in rabbits.

2. The treated animals died earlier than the controls.

3. No sterility of the empyema was produced.

4. The clinical value of these observations is discussed.

I have to thank Professor Evarts A. Graham for providing facilities for the work, Professor J. J Bronfenbrenner for helpful criticism, and the Winthrop Chemical Company for supplies of prontosil.

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PRIMARY CARCINOMAS OF THE STOMACH AND SIGMOID COLON OCCURRING SIMULTANEOUSLY

BY

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Dr. Pemberton and Dr. Waugh of the Mayo Clinic, in the August, 1937, issue of *Surgery*, describe a case of a male physician, aged 57, who was admitted to their clinic suffering from a cancer of the sigmoid flexure of the colon. At operation primary growths were found to be present both in the colon and in the stomach. The tumour in the colon was excised after the manner described by Paul and Mikulicz, a subtotal resection of the stomach being undertaken some weeks later. Microscopically both growths were adenocarcinomas, and both were Grade 2. They write:

"Multiple primary carcinomas which affect the same individual have aroused the interest of the profession since the first reports of such lesions in 1869 by Billroth, although the frequency with which present-day pathologists report this finding is tending to make it almost commonplace. However, the finding clinically of two separate and distinct carcinomas appearing simultaneously in the sigmoid flexure and stomach is rare, and this, coupled with the fact that both lesions were amenable to surgical treatment, makes the report of the . . . case unique. . . . The case . . . cited is, so far as we are aware, the only recorded instance of successful surgical removal of simultaneous independent carcinomas of the stomach and sigmoid flexure."

In view of these statements and also because I have had in my own practice recently a similar case, in which, however, it proved possible to excise at one single operation (partial colectomy and subtotal gastrectomy) both the primary growth in the sigmoid colon and the cancer of the stomach, I have considered it worth while to submit a record of the details of this case.

Case Report

A married woman aged 55 was admitted under my care at the Southend General Hospital on June 26, 1937, complaining of intermittent bouts of abdominal pain, loss of weight, and severe constipation. Some three months before her admission she stated that she had had several recurrent attacks of abdominal pain situated mainly centrally, but occasionally referred to the left side rather low down. The pain lasted only a few minutes, but was cramp-like and intractable. The attacks had no relation to food and did not appear to be relieved by medicines.

Approximately one month before admission she was seized with severe subumbilical colic and vomiting, which lasted for over six hours and then cleared up spontaneously. She had always been constipated, but this was becoming progressively worse, there being no history of attacks of alternating diarrhoea and constipation or of blood and slime in the motions. She had been gradually losing weight, and estimated that she had lost about two stone in three or four months. Her appetite was good and there were no symptoms of indigestion or other gastric disorder.

On examination she was thin and pale, the tongue was clean and moist, the abdomen was scaphoid rather than distended, and there was a palpable movable lump about two inches below and to the left of the umbilicus. A digital rectal examination as well as a sigmoidoscopic examination proved negative. A complete blood count showed that there was a slight degree of secondary anaemia, and the barium enema revealed a small annular stricture at the beginning of the sigmoid colon.

On July 3, after a week's pre-operative preparation, the abdomen was explored (under spinal anaesthesia) through a left oblique Kocher incision which started at the tip of the tenth costal cartilage and proceeded vertically downwards towards the pubis, all the layers of the abdominal wall being divided in a line with the incision. A small freely movable growth was located in the gut at the point indicated by the barium enema. The abdomen was further explored to ascertain whether there were any metastases in the mesocolon, along the aorta, in the omentum, or in the liver. No enlarged glands could be detected in the mesocolon or elsewhere, but while a hand was being swept upwards into the epigastrium to palpate the right lobe of the liver an indurated mass was felt on the lesser curvature of the stomach; this was thought to be in all probability an early cancer of the stomach and not a secondary implant from the original growth in the colon. The descending and sigmoid colon was freely mobilized, and some twelve inches of gut (including the growth) exteriorized and resected by Paul's method.

The abdominal wound was closed as snugly as possible around the two short projecting portions of colon, and the clamps were left *in situ*, occluding the proximal and distal ends. This area of the operation was isolated with sterile towels, and as the resection of the colon had proved a simple matter and the patient's condition was highly satisfactory, after fresh sterile gowns, gloves, etc., had been donned, the epigastrium was immediately prepared for exploration.

Through a median vertical epigastric incision the stomach was examined and was found to contain an ulcerated area in the middle of the lesser curvature about one and a half inches long by two inches wide. On invaginating the stomach in the region of the greater curvature the ulcer could be felt to have a raised indurated edge, which was of stony-hard consistency. There were a few shotty glands along the lesser curvature, but these did not appear to be malignant, nor was there any involvement of the visceral peritoneum of the stomach.

A subtotal gastrectomy, with removal of the great omentum, half of the first portion of the duodenum, practically the whole of the lesser curvature, and two-thirds of the greater curvature with all the adjacent lymph glands, was performed. The jejunum was brought over the transverse colon and its proximal portion anastomosed to the cut end of the stomach after its top half had been closed, the proximal loop of the jejunum being applied to the reconstructed lesser curvature and the distal loop to the greater curvature, after the manner suggested by Hoffmeister.

At the completion of this anastomosis it was found that the proximal jejunum took a rather short and graceful curve to the point of anastomosis, and it was therefore not considered necessary to perform an entero-anastomosis between the proximal and distal loops, a procedure which is much favoured by Balfour. The abdominal wound was closed in the usual way without drainage.

The patient made a splendid recovery, and was discharged on August 13 with the colostomy working well. She was readmitted on September 18, and a clamp was applied to the colonic spur on the Paul-Mikulicz stoma, while on September 29 the colostomy was closed under spinal anaesthesia. Shortly after this the bowels functioned naturally, and the patient's condition to-day leaves nothing to be desired.

The pathologist's report was adenocarcinoma of the sigmoid flexure without any involvement of the lymph nodes in the mesocolon which had been excised, and the microscopical section of the ulcer in the stomach likewise showed adenocarcinoma undergoing colloid degeneration. Several glands which were adherent to the stomach, and particularly those adjacent to the ulcerated region of the lesser curvature, were examined microscopically, and all were found to be normal in appearance.

A NOTE ON EPIDEMIC DROPSY

BY

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Several articles have appeared in the medical literature of the last few years referring to epidemic dropsy in India and other countries of the East, and associating outbreaks of the disease with the use of mustard oil for cooking purposes. The most recent we have seen is that by Lal and Roy (1937), who give a description of the disease and the various theories that have been put forward as to its causation, and who have come definitely to the conclusion that the ingestion of mustard oil is the cause. They admit that the majority of people who use mustard oil for cooking do not get the disease, and conclude that only certain forms of the oil sold commercially are toxic. In spite of several experiments they were unable to distinguish between harmless and harmful mustard oil. The Annual Report of Fiji for 1927, quoted by J. N. Leitch (1930), describes an outbreak there in which mustard oil certainly appears to have been the cause, and gives a detailed account of the symptomatology.

Three Recent Cases

Three cases which have been under our care recently at the General Hospital, Singapore, would seem to add corroborative evidence to these conclusions. The syndromes present suggested to us a common toxic origin, such as from some drug or plant taken internally. We consulted Professor R. B. Hawes of the Singapore College of Medicine on the matter, and he informed us that he had come across a similar syndrome in a few people some years previously, and that it had corresponded closely with mustard-oil poisoning or epidemic dropsy as described in the Fiji Annual Report mentioned above.

Case 1.—A male Bengali was admitted to hospital on June 17, 1937, complaining of general malaise. There was cardiac irregularity due to premature beats, microcytic anaemia, and oedema of the legs with the overlying skin of a dusky purplish colour. There was no fever while in hospital. He improved gradually with rest in bed and iron internally, and was discharged comparatively well on July 29, though still with slight oedema of the legs.

Case 2.—The wife of Case 1, also a Bengali, was admitted on June 24, 1937, complaining of pain and swelling in both legs and of one month's continued fever. Her temperature was 101° F. on admission, but this rapidly subsided in hospital. Her legs were oedematous from knee to ankle, tender, and painful, and were discoloured a peculiar mottled purplish red, rather more strikingly so than her husband's. There was a loud systolic cardiac murmur, heard best over the pulmonary area, as well as tick-tack rhythm. She was treated with iron for the anaemia, and with methylene blue (on account of a possible toxic element in mustard oil being a cyanide derivative.) She was discharged much improved on August 1, but with considerable anaemia still present.

Case 3.—The sister of Case 2 was admitted on June 27, 1937, seriously ill. Her legs were oedematous and intensely painful and tender; she also had had fever for one month, and this took some time to subside in hospital. The patient's legs were still more strikingly discoloured with purplish-red mottling. There was a dry irritating cough, and dry coarse crepitations all over both lungs. The heart was rapid and slightly irregular, with tick-tack rhythm, a loud mitral systolic murmur, and an accentuated second sound at the pulmonary area. The urine was normal and the blood urea 36 mg. per 100 c.cm. Teleroentgenography of the heart showed enlargement, but when repeated at the end of treatment there was a considerable reduction in size. Microcytic anaemia was present, a little more severe than in the other two cases; the red blood cell count was 2,600,000 per c.mm., and the haemoglobin 44 per cent.; there was slight leucopenia. On July 15 she complained of blindness in one eye. On examination small scattered retinal haemorrhages were seen, one on the macula; these all cleared up before the patient was discharged on August 15, when the sight of both eyes was good. She was treated on the same lines as Case 2, with additional symptomatic treatment for the cough. On discharge there was still some anaemia and a pulse of rather poor volume, but the cardiac murmur had practically disappeared.

Conclusions and Commentary

These three patients had lived in the same house and shared the same meals; a fourth member of the family, a brother of the two girls who had previously lived with them, stated that he had also been affected in a mild form, and that he had suspected the food and had accordingly changed his abode. Mustard oil was used daily in the household cooking, and had been so used constantly in the past without ill effect. Some of the oil from the household was subjected to chemical analysis and also used for animal-feeding experiments; these were kindly undertaken by the Government analyst, Mr. M. Jamieson. The results were entirely negative, but it is doubtful whether the oil we obtained was from the same tin as that which had caused the illness; all the contents of that tin had probably been consumed before the patients came to hospital. On inquiry we found that a few other cases had occurred in the town, and we obtained other specimens of oil for examination, but none was found to be toxic to animals.

The syndromes of these patients fit in well with the usual description of epidemic dropsy, and differ from beriberi by the presence of the purplish-red mottling of the skin of the legs, the retinal haemorrhages, the fever, and the lung signs. The disease throughout the world appears only to have been observed among people who use mustard oil for cooking their food, and then merely in sporadic outbreaks; it is strange that the toxic element present has so far defied analysis.

We are indebted to the Director of Medical Services, Straits Settlements, for permission to publish.

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G. de Flora and A. Crocetta (*Minerva med.*, December 2, 1937) state that though the hypotensive action of acetylcholine was demonstrated by Hunt and Taveau in 1915, the introduction of this drug into clinical medicine did not take place until 1928, when Villaret and Besançon were among the first to use it in various vascular disturbances of spastic origin, in scleroderma, and in lead poisoning with encouraging results. Their findings were confirmed by numerous Italian workers, but later investigators showed the extremely transient action of the drug, a dangerous diphasic stage, and an injurious influence on the heart. Subsequently, however, it was shown that the action of acetylcholine was counterbalanced by eserine, and the present authors found that the combination of acetylcholine with eserine made the hypotensive action of the former much more persistent without causing any dangerous diphasic stage.

SCHICK RELAPSE AFTER DIPHTHERIA

BY

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Second attacks of most infectious diseases are somewhat rare. A history of a previous infection in a child suffering from a typical attack of measles raises grave doubt as to the correctness of the earlier diagnosis. Similarly, infection with chicken-pox, rubella, variola, mumps, and the organisms of the enteric group confers an immunity which, if not lifelong, is of many years' duration. Even vaccinia confers sufficient immunity to exert some protective effect for a period as long as the average expectation of life at birth (Hanna, 1913).

The position with regard to scarlet fever and diphtheria is not nearly so clear-cut. Second attacks of both diseases undoubtedly occur. Rolleston (1929) found that of 3,000 cases of diphtheria forty (1.3 per cent.) had relapses and sixty-seven (2.2 per cent.) gave a history of a previous attack. Fortunately we have in the Dick and Schick tests yard-sticks which may be used as a measure of the relative immunity conferred by the primary infection. While we cannot say that a Dick-negative person is unable to contract scarlet fever or that a Schick-negative person is unable to contract diphtheria, we know that they are much less liable to do so than a corresponding Dick-positive or Schick-positive person. We know, too, that even if they are so unfortunate as to contract either disease their chances of rapid uncomplicated recovery are very much greater than those of the Dick-positive or Schick-positive person.

The object of this investigation was to form some idea of the frequency with which cases reverted to Schick-positiveness six or more weeks after an attack of diphtheria. All the patients received serum, and so they must at some time during their illness have been Schick-negative either actively, as a result of their own antitoxin, or passively, as the result of the antitoxin administered. Schick (1911) himself noted the rapid disappearance of antitoxin after an attack in some cases. Dudley (1923) reported that of fifty cases of clinical diphtheria occurring at the Royal Naval School, Greenwich, eight were still Schick-positive or gave a positive combined reaction three to six months after an attack. He did not encounter a second case in any boy who had had a previous attack, in spite of prolonged exposure to infection under ideal circumstances for its spread. He deduced, therefore, that "one attack of diphtheria confers immunity in the vast majority of instances, even if the Schick reaction remains positive."

However true this statement may be, the practitioner in charge of a Schick-positive case of clinical diphtheria cannot excuse a delay in giving serum even though he may be sure that the patient has had a previous attack. His duty is too plain to be avoided. The theories of sub-immunity developed by Glenny (1925), however accurate they may be in the mass, cannot be relied upon in any individual case, for clearly if a patient's circulating antitoxin is less than the amount required to render him Schick-negative we have no ready method of finding out whether he is only just susceptible or entirely unprotected. Delay may do no harm or may be dangerous, none can say which. Treatment on these lines becomes a gamble.

The Investigation

Eighty-seven entirely unselected cases of diphtheria were Schick-tested six or more weeks after a definite clinical attack. The diagnosis was confirmed bacteriologically in every case. Nine gave a positive reaction. They were retested with the same result. Seventy-one were females, of whom seven were positive, and sixteen were males, of whom two were positive. The age distribution was as follows:

	0-2 years	2-5 years	5-10 years	10 years or over
Number of cases ..	1	17	48	21
Positive reactors ..	—	1	6	2

It was thought that perhaps the day of disease on admission, which was also the day on which serum was given, might be in some way connected with the Schick relapse. The cases were grouped:

	Day of admission		
	1st and 2nd	3rd to 5th	6th day and over
Number admitted	20	47	20
Number positive	3	4	2

They were also grouped according to the localization of the disease:

	Faucial	Nasal	Combined Faucial and Nasal
Number of cases	51	10	26
Positive reactors	7	—	2

and again according to the dosage of serum employed:

	Dose in thousands of units		
	2-8	12-32	32-216
Number of cases	50	22	15
Positive reactors	5	3	1

The Schick test was performed between the sixth and twelfth weeks in seventy-one cases, seven of these being positive, and between the twelfth and twenty-fourth weeks in sixteen cases, with two positive results. Paralysis occurred in thirty-one cases. Only one of these was later found to be Schick-positive. No paralysis occurred in the other fifty-six cases, and eight of these were later Schick-positive.

The Schick-Positive Carrier

One Schick-positive patient had had a previous attack twelve months before. Three had virulent diphtheria bacilli in their throats at the time they were Schick-tested, yet none had any clinical evidence of the disease. One of the three, who had been a chronic carrier for nearly three months, developed a second attack in the twenty-fourth week. She received 2,000 units of antitoxin.

The criteria adopted for the diagnosis of a second attack were the presence of a clinically diphtheritic lesion in the nose or throat, a Schick-positive reaction in the patient, and the bacteriological finding of virulent diphtheria bacilli in the swabs taken from the lesion. The fact that other organisms were found in the cultures was not held to affect the diagnosis, for more often than not it is the rule to find in association with the causative bacillus other

bacteria, notably streptococci and less frequently Vincent's organisms, in any series of diphtheria patients. Pure cultures of diphtheria bacilli are obtained from carriers rather than from cases. Indeed, the associated organisms or secondary invaders may so overwhelm the cultures obtained from the most severe of infections that a second or third swab has to be taken to establish a bacteriological diagnosis the clinical counterpart of which has never for a moment been in doubt.

These three cases raise again the question of the Schick-positive carrier. Dudley (1923) says that so far as his experience goes the Schick-positive carrier is unknown. How, then, is a susceptible individual to obtain natural immunity except by an attack of the disease? That some do obtain it by another way is obvious, for how otherwise could 70 to 80 per cent. of adults have become insusceptible? Not all nor even the majority of them have had a clinical attack of diphtheria. Surely at one time in their history they must have been at least temporary carriers of small numbers of virulent diphtheria bacilli.

Immunization of the Schick-positive cases was carried out in six instances. Two doses of alum toxoid were used on four occasions and three doses of toxoid-antitoxin mixture on the other two occasions with complete success. It is strange to reflect that active immunity may be more readily produced by artificial than by natural means.

Summary and Conclusions

The results of Schick-testing a series of patients six or more weeks after an attack of diphtheria are reported. These results have suggested the following conclusions:

1. That after an attack of diphtheria, irrespective of its severity, about 10 per cent. of persons remain potentially susceptible.

2. That the chance of remaining susceptible is not diminished by delayed administration of serum.

3. That immunity is either developed early—that is, before the sixth week—or not at all.

4. That cases developing paralysis would appear generally to have acquired immunity.

5. That cases which do not develop a natural immunity as the result of infection respond satisfactorily to active artificial immunization.

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In the twelve months September 30, 1936, to September 30, 1937, eighty-seven students received training in the medical side of missionary work abroad at Livingstone College. The annual report contains numerous personal tributes to the practical value of this training, which is available for all Christian missionary students without any denominational discrimination. There was a small financial deficit on the year's working, due in large measure to a fall in the amount received from the students' fees. The number of students, it is mentioned, has slightly increased, but the majority in that year only came for short periods. The report contains also the speech delivered at the Commemoration Day meeting in June, 1937, by Mr. W. A. Cadbury, relating to his work in Northern India. The volume of testimonies to the usefulness of the curriculum at Livingstone College shows how missionaries thus trained can be of the greatest value in parts of the world where ordinary medical assistance is scanty.

Clinical Memoranda

"Mixed Tumour" of the Lip: Report of Two Cases

After reading Mr. R. Pilcher's article in the *British Medical Journal* of May 8, 1937 (p. 967), I feel that the following two similar cases of "mixed tumour" of the lip are worth recording. Case II came to my notice a few weeks following the appearance of Mr. Pilcher's article; the other was encountered in 1935.

CASE I

A Chinese woman, aged 24, had had a swelling on the right side of the lip for four years. The tumour was oval, about the size of a walnut, and quite firm.

Histologically the tumour consisted of a fibrous tissue stroma in which were strands of epithelial cells, most of them in alveolar formation, and some appeared to be lining the lymph spaces. Small dark epithelial cells with hyperchromatic nuclei arranged in solid masses were also in evidence. In various areas mucoid and osteoid tissue as well as hyaline material were seen. Lymphocytic infiltration was pronounced in various parts of the tumour.

CASE II

This patient, a Chinese woman aged 36, had had a painless slow-growing swelling on the upper lip for thirteen and a half years. There was no history of trauma, the swelling having first started as a small reddish nodule, growing very gradually. On examination it was found to be hard, pedunculated, and freely movable. It was covered by a tense skin, and several prominent vessels could be seen on its surface. Its under-surface was continuous with the mucous membrane of the lip. The removal of the tumour was followed by a skin graft.

The specimen was oval in shape and about 3 by 2.5 cm. It was firm, encapsulated, and covered by skin. On section it showed a white and opaque smooth surface, containing several small yellowish areas.

The histological report was as follows: "Section shows acini and solid clumps of epithelial cells lying in a fibrous connective-tissue stroma, which in places appears myxomatous. The acini are lined with low cubical or flattened epithelium. Their contents appear pink-staining and homogeneous. Some of the acini are dilated and cystic. The solid masses, with their closely packed cells and a tendency to form cell nests in the centre, present a striking resemblance to squamous epithelium. Distributed in the stroma are seen cartilage-like areas and foci of lymphocytic infiltration."

These two cases were encountered in the course of the routine examination of biopsy material submitted by the University Surgical Clinic. Reports of similar cases in other parts of China are lacking.

I am much indebted to Professor K. H. Digby for the clinical reports.

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Department of Pathology, University of Hong Kong.

A Case of "Mixed Tumour" of the Upper Lip

I was greatly interested in the case of "mixed tumour" of the lip reported by Mr. Robin Pilcher in your issue for May 8, 1937. By a coincidence it so happened that on the day on which I read his report an almost exactly similar case was in my wards awaiting operation.

CASE RECORD

The patient was a Hindu lady, aged 25, who came to hospital complaining of obstruction to breathing through her right nostril. This was found to be due to a swelling the size of a walnut in the substance of the right upper lip. She stated that the swelling had started without cause three years previously, and that it had grown slowly, causing no disability until a few months before, when the obstructed breathing had come on.

The tumour was firm, coarsely lobulated on the surface, quite free from attachment to skin and mucous membrane, of even consistency with a definite edge, freely mobile, not translucent, and not tender. An out-patient diagnosis of a "submucous retention cyst" was obviously wrong, and was altered to that of a "mixed tumour" as soon as the case was seen. The tumour was removed through an incision in the mucous membrane of the lip, and shelled out with perfect ease. Convalescence was normal. The pathological report, for which I am indebted to Dr. P. Ramachandra Rao, professor of pathology in the Vizagapatam Medical College, is as follows:

PATHOLOGICAL REPORT

"*Naked-eye Appearance.*—The tumour is an irregularly oval, greyish-white, slightly bosselated, encapsulated, fairly firm mass about the size of a marble ($1\frac{3}{4} \times 1\frac{1}{2}$ cm.). The greyish-white cut surface is slightly bulging, faintly lobulated at the periphery, and shows an irregular slightly depressed white fibrous area at the centre. The bulging periphery has a mucoid adenomatous appearance. No cysts are, however, distinguishable even with the magnifying glass.

"*Microscopical Appearance.*—The section shows small spindle-shaped cells with oval plump nuclei containing one or two nucleoli and with scanty cytoplasm, arranged closely in sheets or branching columns or in the form of alveolar networks. In some places the cells form a cluster of branching papillae with very delicate hyaline connective-tissue cores. In others, especially about the cicatricial centre, rounded masses of these cells undergoing hyaline change have formed typical epithelial pearls. In still other areas tubular spaces of varying size, but principally of microscopic dimensions, with homogeneous hyaline contents and lined by cuboidal epithelium in which the nuclei lie near the base, are seen. Some of the tubules have a double lining of the epithelial cells—the distal layer being more columnar in shape. The stroma is formed principally by a mucoid embryonal type of connective tissue, which contains lobules of fatty tissue in places. The centre, however, shows dense hyaline connective tissue with septa radiating from it to the periphery between the epithelial masses giving rise to the lobulated appearance. Cartilage is not in evidence. The stroma, however, shows a fair amount of elastic tissue, particularly in the centre. The vessels are thin-walled and scanty.

"The tumour belongs to the group of 'mixed tumours' of the salivary gland, and may more appropriately be called epithelioma adenoides cysticum."

MAJOR F. M. COLLINS, M.B., F.R.C.S.,
Medical College, Vizagapatam. Principal and Professor of Surgery.

An International Congress on Rheumatic Diseases will be held at Bath, March 31 to April 3, to celebrate the bicentenary of the Bath Royal National Hospital for Rheumatic Diseases. Lord Horder will deliver the presidential address. In a discussion on "Gout and Chronic Rheumatism of Metabolic Origin" Sir Walter Langdon-Brown and Dr. Mathieu-Pierre Weil will be among the opening speakers. Other papers will be read, and the programme also includes a demonstration of cases at the hospital, a mayoral reception and dance, a banquet at the Guildhall, a tour of the baths, and excursions to places of interest in the neighbourhood. Particulars can be obtained from the joint honorary secretary, Dr. G. D. Kersley, 6, The Circus, Bath.

Reviews

APPENDICITIS

Appendicitis. A Clinical Study. By W. H. Bowen, M.S., F.R.C.S. With an introduction by Sir Arthur Hurst, D.M., F.R.C.P. (Pp. 202. 7s. 6d. net.) Cambridge: At the University Press. 1937.

Mr. W. H. Bowen's monograph on appendicitis is a clinical study, and in his preface the author states that his aim is to give the student and practitioner a broad outline of the common varieties of disease of the appendix. For this reason rarer manifestations such as actinomycotic, tuberculous, and malignant disease have been excluded. Aetiology, diagnosis, complications, prognosis, and treatment are discussed in a work of some two hundred pages, in which illustrative cases are also recorded. Chapters on obstructive appendicitis, appendicitis with pregnancy, and the controversial subject of chronic appendicitis are of particular interest. Mr. Bowen favours the pararectal (Battle's incision) approach in most cases, but advises the muscle-splitting incision when the disease complicates pregnancy. The discussion on when to carry out expectant treatment is clearly and logically put, and there can be no disagreement with the conclusion that unless indications for delay are definite and unmistakable the safest and wisest course is immediate operation.

In an introduction Sir Arthur Hurst writes that physicians will welcome a definite statement as to the indications for surgery in chronic appendicitis, with a very convincing analysis of a series of cases in which there has been no recurrence of symptoms over a period of several years following operation. There will be general agreement with the statement that "a man who instead of insisting on a preliminary thorough examination is ready to say, 'Let us have a look inside—we can always remove the appendix,' should have gone into business instead of becoming a surgeon." This work should have a particularly wide appeal, for there is much in it to interest radiologists and physicians as well as surgeons and general practitioners. It is a really excellent account of the aetiology, diagnosis, and treatment of the various types of appendicitis, and a most welcome contribution to our knowledge of this very frequent condition, which even to-day has a regrettably appreciable mortality.

NEUROLOGICAL DIAGNOSIS

The Diagnosis of Nervous Diseases. By Sir James Purves-Stewart, K.C.M.G., C.B., M.D., F.R.C.P. Eighth edition. (Pp. 842; 337 figures. 35s. net.) London: E. Arnold and Co. 1937.

It is a remarkable thing for a book on diseases of the nervous system to reach an eighth edition in a period of just over twenty years. That it should do so is a proof of its widespread popularity and utility. It is not uncommon for the general practitioner to complain that the diseases of the nervous system are so complex and confusing that he can make neither head nor tail of them, and yet he can hardly go through one day's work without being met with signs or symptoms associated with the nervous system. Pain, paralysis, or peculiarity of conduct are all daily problems which are difficult to elucidate from the systematic textbook, and what he wants is to be able to look up accounts of these various symptoms which will guide him in assessing the probable cause. This is just what "Purves-Stewart" gives him, and no doubt accounts for the book's success. To the erudite

neurologist this method may seem of doubtful orthodoxy, and he will no doubt consider the expositions in many cases superficial and even in some respects misleading; yet even he, when asked to give a clinical lecture to students or masseuses, or some such not too critical audience, on headache or involuntary movements or such-like topic, will turn with gratitude to Purves-Stewart to make sure that he has adequately covered the ground.

Several of the chapters have been rewritten in this edition to bring them up to date without, as the author himself remarks, altering the original conception and plan of his subject. Nor, fortunately, has this rearrangement added to the length of the book, already extended to over 800 pages. To try to give any conception of which parts of this edition are new would involve more than can be compassed in a review, and it may be more useful to remind old readers of its scope and introduce new readers to its usefulness. After a short review of the physiological anatomy of the nervous system and methods of case-taking, such symptoms as delirium and coma are dealt with, then involuntary movements from convulsions to rigors are described. There is a useful summary of aphasia and disorders of articulation, followed by a discussion of the diagnostic significance of lesions of the cranial nerves. This leads to chapters on the differential diagnosis of pain and abnormalities of sensation, which are particularly useful to the practitioner. Paralyses of all types are dealt with, and a useful clinical description is given of incoordinations and peculiarities of postures and gaits. Trophoneuroses of endocrine origin are dealt with, as are affections of the vegetative nervous system. There are useful sections on the significance of reflexes, electro-diagnosis and prognosis, and cerebrospinal fluid findings. A chapter on psychoneuroses is inserted, and while this will not please all modern psychologists it contains many good clinical descriptions, especially of hysterical syndromes. Disorders of sleep are discussed briefly, and finally there is a long chapter on intracranial tumours, which is founded on the author's book on this subject.

The volume is well produced, with copious case histories and good illustrations, and is written in the easy readable style which we expect from the author. We have every expectation that the present edition will prove as useful and popular as its predecessors.

YEARBOOK OF RADIOLOGY

The 1937 Year Book of Radiology. Edited by Charles A. Waters, M.D., Whitman B. Firor, M.D., and Ira J. Kaplan, B.Sc., M.D. (Pp. 503; 550 figures. 4.50 dols. or 19s.; postage inland 7d., abroad 1s. 3d.). Chicago: The Year Book Publishers, Inc.; London: H. K. Lewis and Co. Ltd. 1937.

This yearbook maintains the high standard of its predecessors. The first of the series appeared in 1932, and the form of the book has not altered much since then. It is, as usual, in two parts. Part I, Radiologic Diagnosis; Part II, Radiotherapeutics. The international literature of the previous year has been carefully searched, and almost all that is new is commented upon, with suitable illustrations and references. Attention might be specially drawn to the injections of opaque substances and to the effect of drugs on the gastro-intestinal and genito-urinary tracts.

An excellent article by Twining of Manchester on "Tomography by Means of a Simple Attachment to the Potter-Bucky Couch" is referred to and a good description of the apparatus is given, with diagrams and its method of use. There is a useful chapter on the teaching and principles of practice, which includes long extracts from a paper by Kornblum and Tumen on "What the Radiologist Should Know about Clinical Pathology." Many instructive cases of rare pathological conditions of the gastro-intestinal system are recorded, and extracts from a paper by Ritvo on drugs as an aid in roentgen examination of the gastro-intestinal tract should prove of great interest.

Under radiotherapeutics all the various methods of *x*-ray and radium treatment are dealt with, and one chapter is devoted to radiation physics. The work of Eve and Grimmett of London on radium beam therapy is referred to, and the difficulty of obtaining from radium a large depth dose, on account of the short distance at which it must be used, is discussed, and beam therapy is compared with high-voltage *x* rays. Low-voltage near-distance *x*-ray therapy is described, and Chaoul's work in making this method applicable to lesions of internal organs is outlined. The latest "super-voltage" therapy—that is, kilovoltages of 1,000 and upwards—is discussed, but the author is of opinion that notwithstanding its theoretical advantages it has yet to be proved that it is of enough practical value to warrant the enormous expenditure required for its installation. The reports from various clinics where this particular form of therapy is employed still leave doubts as to its value.

A short chapter on radiation injuries is of great service and should be read by all radiotherapists. There is an excellent summary of a paper on "*X*-Ray and Radium Injuries of the Skin and Mucous Membrane" by M. C. Tod of Edinburgh. In this the danger of overdosage, with the final production of *x*-ray cancer some years later, is discussed. The book is well illustrated throughout and there is an excellent index.

MENTAL HOSPITAL ADMINISTRATION

Administrative Psychiatry. By William A. Bryan, M.D. (Pp. 349. 15s. net.) London: George Allen and Unwin Ltd. 1937.

It was the reviewer's good fortune to meet Dr. William Bryan a few years ago and to spend a day at the Worcester State Hospital. From reading his book one might be inclined to picture Utopian buildings and equipment and to congratulate him on his good luck to preside over them. In actual fact the bricks and mortar are neither better nor worse than in the average mental hospital here or in America, but the administrative philosophy and leadership have produced a spirit of enthusiasm and co-operation which has made Worcester one of the most famous mental hospitals in America.

This book explains the philosophy of "participative democracy" upon which the hospital is run, and in addition gives a great many details of administrative technique. Dr. Bryan has an exceptionally high ideal of what a mental hospital should be and for what it should stand in the life of the community. He would no doubt be dubbed an impractical visionary had not most of his ideas become current practice during his many years of superintendence at Worcester.

Such a frank and detailed book, covering as it does the whole field of hospital organization and administration (there are chapters on building a staff, on the nursing problem, teaching, co-ordinated research, "public relationships," etc.), must inevitably contain many debatable ideas—for instance, the wisdom of the practice of periodic rating for efficiency of the nursing staff by a medical committee. But Dr. Bryan points out that psychiatrists have not hesitated to "sell" their psychological theories of management to the industrial world, though in the

psychiatric hospitals these principles have often escaped our attention. He believes that the best way to build up a loyal and enthusiastic personnel is by developing a true democracy in management. Dr. Bryan has written a most useful and stimulating book.

REGIONAL ANATOMY IN BRIEF

Short Manual of Regional Anatomy. Written for the Medical Student as an Aid to a Rapid Revision of the Whole Subject. By J. A. Keen, M.B.Lond., F.R.C.S.Eng. (Pp. 167; 76 figures. 5s. net.) London, New York, Toronto: Longmans, Green and Co. 1937.

This small book has been written for the medical student as an "aid to rapid revision of the whole subject." It differs considerably from other works with a similar purpose. Keen's *Manual* is an attempt to combine the purely verbal descriptions of certain well-known anatomical revision books with the pictorial or diagrammatic method. The mental exercise of remembering a written description is thus assisted by a visual concept. The book is well written, terse, and to the point, and although some parts are more fully dealt with than others it does cover most of the matter that a student is required to know for the ordinary examinations, and should prove specially useful to a type of student who in his endeavours to be thorough in the study of one particular region—for example, the central nervous system—finds shortly before an examination that he has no time for revision of other important parts. But it is obvious that however skilful the author may be he cannot compress the whole subject of human anatomy within the limit of a small book such as the one we are considering. A surprising amount of information is, however, contained in Keen's *Manual*, and we can recommend it for use in the way which has been indicated—namely, that of revision.

We have little in the way of constructive criticism to offer. Certain of the illustrations, however, are, as the author himself admits, "very diagrammatic"—for example, Fig. 74 (p. 140) and Fig. 75 (p. 142). These might be improved with benefit both from the artistic and educational standpoints. There are many students, however, who will not worry themselves about aesthetic considerations so long as the book will help them to get through their examinations, and it is for these that it is intended.

BACTERIOLOGICAL DIAGNOSIS OF TUBERCULOSIS

Diagnostic Bactériologique de la Tuberculose. By A. Saenz and L. Costil. (Pp. 240. 40 fr.) Paris: Masson et Cie.

Rapid strides have been made in the last few years in the bacteriological diagnosis of tuberculosis; but the clinician is apt to be confused by the large amount of published work, not seldom contradictory. A concise authoritative statement on the relative value of the different methods was overdue. This is now provided in the book by Drs. Saenz and Costil, published from the Pasteur Institute. The authors deal purely with the bacteriological aspects, but their findings, based on extensive personal experience, are put forward briefly and clearly. There should be no difficulty in applying their conclusions to clinical work.

A historical sketch of the culture of the tubercle bacillus is followed by a brief description of the various culture media, and the results of studies of their comparative value and of the relative sensitiveness of the methods of culture and guinea-pig inoculation. The authors describe the method of culture they have found most satisfactory, and give the experimental work on which this opinion is based. A chapter is devoted to the precautions that must be taken in interpreting results obtained by the direct method, the culture method, and guinea-pig inoculation; and a simple method of determining the type of the bacillus is described. The bacteriological diagnosis of tuberculous materials—sputum, pleural effusion, cerebrospinal fluid, urine, gastric lavage fluid, and specimens removed at necropsy—is discussed in detail. The last section, which forms a third of the volume, is devoted to the authors' investigations on tuberculous bacillaemia. The work was partly carried out in connexion with the inquiry of the Health Organization of the League of Nations into the claims made by Loewenstein.

This is a most useful publication, though we should like to make one criticism. A summary or conclusions at the end of each section would have been of great help to the busy practitioner. This, however, could easily be corrected in a future edition. The book fills a gap, and can be unhesitatingly recommended to all tuberculosis workers.

Notes on Books

We have received a copy of the second volume of the *Transactions of the Institute of British Surgical Technicians*, which contains among other items of interest, papers on "Hearing and Hearing Aids," by Mr. Terence E. Cawthorne, on "Modern Operation Theatre Technique," by Mr. F. F. Rundle, and on "Sterilization of Surgical Ligatures," by Sir Weldon Dalrymple-Champneys. There is also an interesting paper by Mr. H. C. Hopcraft on "Stainless Steel." The price of the volume is 30s. net.

The third volume of the forty-seventh series of *International Clinics* consists of seven sections devoted respectively to medical clinics at the Johns Hopkins Hospital: tuberculosis and syphilis, diseases of the lungs, cardiovascular disease, endocrinology, diseases of metabolism, and diseases of joints. The publishers are J. B. Lippincott and Co., and the price is 50s. a set of four volumes.

The last fasciculus of Vol. iv of the *Traite de Biocolloidologie* by Professor W. KOPACZEWSKI deals with narcosis (Paris: Gauthier-Villars, 35 fr.). The author has collected extensive data concerning the physicochemical properties of narcotics and the action of narcotics on the hydration of proteins. It is nearly four years ago that Overton and Meyer showed the remarkable parallel between the lipoid solubility of narcotics and their biological action. Since then the relation between the physicochemical properties and the biological action of narcotics has been the subject of intensive research, and an enormous mass of data has been accumulated. The general result has been to show a remarkable variety of striking parallels. A large number of alternative theories have been evolved regarding the physicochemical nature of narcotic action, but no single one has gained general acceptance. The monograph under review gives an account of certain of these theories, but its length (200 pages) is inadequate to permit an exhaustive account of this very wide problem.

So You're Going to a Psychiatrist? by Dr. ELIZABETH I. ADAMSON (London: Sir Isaac Pitman and Sons, 12s. 6d.), is one more attempt to explain modern psychotherapy to the lay public. The trend of modern medical psychology is explained along Freudian psycho-analytic lines. Four types of "patient" are described—the neurotic, exhibiting deviations from normal in his behaviour, the neurotic

character with a rigid distorted personality, the sex deviate, and the criminal. Stress is laid upon the influence of the neurotic parent in building up the neurotic child, and a plea is entered to let the child grow up instead of overmuch trying to bring him up. There is a brief description of the sort of treatment given by the psychiatrist, and the book begins with a description of a few maladjusted persons and ends with that of a few who have grown up in emotional health. There are a very large number of books such as this, and though Dr. Adamson's is clearly enough written we doubt if it will bring very much more understanding to the laity than its predecessors.

General Selection from the Works of Sigmund Freud, by JOHN RICKMAN (Selwyn and Blount, 5s.), is the first of a series of psycho-analytic epitomes which are designed to give the reader an outline of the development of theory and not an exposition of case histories or a short cut to instruction in treatment by psycho-analysis. The arrangement is in large measure historical, tracing the development of Freud's thought and the modifications he has made in his original theory. The lectures in which he first enunciated his new conceptions are quoted fairly fully, then shorter selections are given dealing with special points such as the pleasure-pain reality concept, the unconscious, negation, the vicissitudes of instincts, repression, character types, narcissism, and depression. Next the further developments are quoted starting with the concepts of beyond the pleasure principle and suicide, the Ego, the Superego and the Id, and the later work on anxiety. Finally there is a bibliography and glossary. The chief attraction of this book will be for those already acquainted with the work of Freud who wish to dip back and remind themselves of certain points without having recourse to each separate volume from the library. It may stimulate interest in the neophyte, but unless he is prepared to go back to the original and study the questions in full this book will not be of much use to him.

We have received a copy of the *Proceedings of the First Congress of Internal Medicine* held by the Argentine Medical Association at Buenos Aires under the presidency of Dr. Rodolfo A. Ayherabide in September, October, and November, 1936. Two subjects were chosen for discussion—namely, bronchiectasis from September 28 to October 2, and chronic appendicitis from November 23 to 27. The work is a richly documented and liberally illustrated volume of 654 pages, which can be strongly recommended to readers of Spanish interested in bronchiectasis and appendicitis.

The *Nurse's Pocket Encyclopaedia, Diary, and Guide for* 1938 (Faber and Faber Ltd.; in ordinary binding 1s. 6d., in superior binding with a pencil 2s.) takes the place of *The Nursing Mirror Pocket Encyclopaedia and Diary*. It is a useful little book containing information on all branches of nursing, and including a section on drugs, a directory of nursing institutions, and many recipes with which to tempt back the convalescent patient's appetite. It has been rather erratically revised, however. A note on prontosil contrasts strangely with a celery-seed recipe for rheumatism. The suggestion that the sterilization of raw catgut is simple is dangerous, and many of the splints and instruments depicted have not even a historical significance.

Dr. VALLERY-RADOT has done a large amount of work on anaphylaxis, particularly in rabbits, and, together with Drs. MAURIC and HOLTZER, he has now produced *L'Anaphylaxie Expérimentale et Humaine* (Paris, Masson et Cie, 36 fr.). The first part of the book deals mainly with the authors' experiments on anaphylaxis in rabbits. A remarkable observation is that rabbits cannot be sensitized passively by the ingestion of serum of sensitized rabbits. Striking photographs showing vasoconstriction during shock, as revealed by arteriography, are included. Anaphylactic shock as seen in guinea-pigs is dismissed in three pages. Much important work done by other investigators is not mentioned. The second part of the book is concerned almost entirely with allergy in man, particularly with the detection and treatment of the allergic state. The authors conclude that the only methods of any value for the detection of the condition are the skin reaction and the Prausnitz–Küstner reaction.

It remains to be seen whether political changes in Germany will react to the permanent detriment of medical research in that country. In certain spheres its contributions have lately been few, and among these is cancer research. It appears to be the object of *Neuere Ergebnisse auf dem Gebiete der Krebskrankheiten*, edited by Dr. C. ADAM and Professor R. AULER (Leipzig, S. Hirzel, RM. 12), to acquaint the medical public of Germany with the present position of cancer research, both clinical and experimental. Its forty-six chapters are devoted, some to the technique of diagnosis and treatment of cancer in different organs, and some to the experimental study of the disease and other aspects concerned with its aetiology. The individual subjects in the latter category include chemical carcinogenesis, viruses, tumour metabolism, racial and other inherent susceptibility, industrial cancer, and methods of serological diagnosis. This compendium will serve its general purpose, but the serious inquirer will find the account of some of these numerous subjects far from complete, and will regret the frequent absence or paucity of lists of references.

Preparations and Appliances

X-RAY MATERIALS AND ACCESSORIES

The medical and scientific department of Kodak Limited have sent their latest catalogue of *x*-ray materials and accessories. What chiefly strikes us is the bewildering number of sizes to which *x*-ray films and papers are cut. The film is supplied on four different types of base and in seventeen sizes denominated by inches and in six others denominated by centimetres. Dental *x*-ray film is issued in nineteen kinds, varying in size and coating. The sizes of *x*-ray papers are almost as varied as those of films, running from a little larger than a lantern slide up to a sheet of 40 by 50 centimetres. The number of accessories which are convenient if not essential to the *x*-ray department continues to increase, and the catalogue gives particulars of cassettes, exposure holders, intensifying screens, negative markers, developing tank outfits, hangers, thermometers, illuminators, and, finally, serial folders, in which are placed six or a dozen barium-meal half-plate reduced prints, complete with report sheet and envelope. A feature is made of an improved type of *x*-ray reduction camera, offering a simple means of making reductions—prints, transparencies, or lantern slides—from negatives up to a size of 17 by 14 in., without visual focusing, automatic focusing scales being provided.

MALTED MILK WITH VITAMIN D

Cow and Gate (vitamin D) malted milk (Cow and Gate Ltd., Guildford, Surrey) is a milk powder which is fortified with a natural vitamin D (cod-liver oil) concentrate. It is recommended as a well-balanced food-drink for persons of all ages.

OSTOCALCIUM TABLETS

Glaxo Laboratories Ltd. (Greenford, Middlesex) have now improved both the flavour and the friability of these tablets, while substantially increasing their calcium content. Two and a half grains of calcium phosphate have been added to the original formula (7½ grains calcium sodium lactate and 500 international units of vitamin D). Thus each ostocalcium tablet now supplies 1½ grains (0.1 gramme) of metallic calcium. The price is unchanged.

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BACTERIOLOGICAL DIAGNOSIS OF TUBERCULOSIS

Examination of smears of suspected material by the Ziehl-Neelsen method has been of inestimable value in establishing a diagnosis of tuberculous disease in the lungs or other organs. But soon after the introduction of the method clinicians realized that in an appreciable proportion of patients it let them down because of the large numbers of tubercle bacilli required to be present in the material examined—estimated by Corper at over 100,000 per c.cm. of sputum, for instance—before bacilli could be detected in the smears. Concentration methods increased the percentage of positive findings. But as by culture an enormous multiplication of bacilli would occur, the possibilities of this method in clinical work were soon being explored. The attempts of Koch and others were unsuccessful because difficulties arose in excluding the growth of secondary organisms. Since 1900, however, the work of Spengler, Piatkowski, Uhlenhuth, Petroff, Petragnani, Loewenstein, Hohn, and K. A. Jensen has led to the perfecting of a method of culture which is now being firmly established in the clinical field. Loewenstein showed that the tubercle bacillus was resistant to high concentrations of acid or alkali; moreover, he prepared a medium, containing egg, asparagine, and Congo-red or malachite-green, on which better and more easily visible growth of the bacillus occurred. Colonies of human bacilli generally appear within twelve to thirty days, bovine colonies not till after thirty days. The characteristics of the colonies of these two types are distinct enough to allow a diagnosis of type to be based on appearance alone, except in isolated cases when animal inoculation is required. Saenz and Costil[1] have recently claimed, moreover, that the date on which the result is obtained can be hastened by the examination of "microcultures." Seven or eight days after incubation a platinum loop is passed over the whole of the surface of one of the tubes inoculated (they recommend inoculation of several tubes), without injuring the medium, and any material collected is spread on a slide and stained by Ziehl-Neelsen's method. The tube is then replaced in the incubator. If the result proves negative the same procedure is carried out on the other tubes on the eleventh, fifteenth, and eighteenth days until "microcolonies" are found, constituted by isolated, or masses of, bacilli. This procedure does not interfere with the ultimate growth of the colonies.

In this country Evelyn Holmes[2] first drew attention to the value of cultivation in the diagnosis of tuberculosis. Edwards, Lynn, and Cutbill[3] have published some results; and the paper by Dr. C. A. Green, which appears elsewhere in this issue, indicates clearly what may be expected from the method in clinical practice. Among 2,796 specimens of sputum examined 19.7 per cent. were positive for tubercle bacilli by direct film, cultural, or combined examinations. Cultivation alone was successful in 98.3 per cent. of all positive results. As Dr. Green points out, the most significant finding was that only 74.3 per cent. of all positive results were detected by the routine film examination. Repeated examination by separate observers confirmed the absence of tubercle bacilli in the original stained smears of the 25.7 per cent. of sputa later proved positive by culture. The comparative results in pleural effusions, pus, urine, and cerebrospinal fluid were less striking, but still in favour of the method of culture. Correlation of the bacteriological with the clinical diagnosis left little doubt as to the reliability of the method. But it is evident that the practice of the method calls for expert technique and interpretation, and that animal inoculation may be needed occasionally for confirmation. For the errors that may be introduced into the method we would again refer the reader to Saenz and Costil.[1]

Dr. Green stresses the point that cultivation much prolongs the time of examination for tubercle bacilli, and on this account careful choice should be made of the material subjected to the treatment. With this we entirely agree. That the direct film examination should be repeated two or three times (if possible) before material is cultured needs no emphasis. But in addition labour may be wasted and a wrong significance attached to a negative result when unsuitable specimens are sent to the laboratory; for instance, a specimen which is nothing more than saliva. In a patient in whom only such material is obtainable a gastric lavage should be carried out, and the contents appropriately treated and cultured and/or inoculated in a guinea-pig. A method so obviously useful in diagnosis would not be without value in the treatment of tuberculous patients. The establishing of "quiescence" on the ground that sputum

[1] *Diagnostic Bactériologique de la Tuberculose*. Reviewed in this issue at page 124.

[2] *J. State Med.*, 1934, **42**, 559.
[3] *Tubercle*, 1936–7, **17**, 391.

is absent, or that direct film examination of sputum is negative, can no longer be justified.

The cultural method is thus of far-reaching importance in treatment of pulmonary tuberculosis and prevention of all forms of tuberculosis. Its universal practice would, moreover, probably influence current statistical notions, the present classification into " sputum-positive " and " sputum-negative " patients being based on vaguely defined and bacteriologically unreliable terms. The method can no longer be regarded as an investigational luxury or as a Continental fad, and facilities for its practice in association with the work of every tuberculosis dispensary and institution should form an essential item in the control of tuberculosis.

MODERN VIEWS ON PELLAGRA

Stannus[1] has recently shown that pellagra, which is endemic in Spain, Italy, Rumania, Egypt, and the southern States of the U.S.A., also occurs in Africa and in the tropical parts of Asia, America, and Australia, notably in prisons, asylums, and similar institutions. Cases are reported, too, in Batavia,[2] among children in Kenya,[3] where the disease is unknown in adults, and in the province of Venice, Italy,[4] where pellagra disappeared almost completely after the great war but is now reappearing and increasing. In view of such widespread distribution a survey of some of the more prominent features of this disease may be of interest. The peak of incidence is between January and March in Lower Egypt[5] and May and July in Georgia, U.S.A.[6] ; in Kenya pellagra may be seen all the year round except in July and August. This geographical variation in seasonal incidence seems to depend on the time of harvesting cereal crops and on the seasonal variation of the intensity of sunshine. In Jugoslavia[7 8] and in Georgia pellagra is much more common among women and in Egypt among men, probably because hard physical work in the open air is done by women in the former and by men in the latter pellagrous regions. Most Egyptian pellagrins are under 30, and the majority of American pellagrins are between 21 and 60 years of age. Skin lesions, glossitis and stomatitis, and diarrhoea affect equally sufferers in the different countries, but changes in the central nervous system, which were found rarely in Lower Egypt, more often in Upper Egypt, and to no noticeable extent among the Kenya children, were very common in the American cases.[9] Again in contrast to the findings in America, peripheral nerve lesions were absent in Egypt. The heart is reported to be unaffected in pellagra by some authors,[10] while others[11] have often found the heart muscle degenerated. In Egypt infection with intestinal parasites is so usual that Ellinger, Hassan, and Taha thought pellagra " secondary " to this condition ; such infection was also common in the pellagrous children of Kenya. Sydenstricker and Armstrong found other disorders in about 50 per cent. of their " endemic " pellagra cases, and three such cases examined post mortem by Spies and his co-workers[12] showed severe non-pellagrous lesions of the gastro-intestinal tract.

Theories of aetiology other than those concerned with defective nutrition have failed to survive for lack of evidence.[13] The view that pellagra is caused by an amino-acid deficiency was put forward by Wilson[14] in 1921, and seemed to explain the association of pellagra with the consumption of maize as a staple cereal, since about 60 per cent. of the protein of maize consists of zein, which lacks the essential amino-acids lysine and tryptophane. There is, however, a mass of experimental evidence showing that the total proteins of whole maize are not very inferior to those of whole wheat, and there are two observations in particular which indicate that pellagra cannot be due to a lack of good protein: the discovery of Voegtlin and his colleagues[15] that a protein-free extract of liver was curative for pellagra, and the complementary observation of Goldberger and his co-workers[16] that a large extra daily ration of purified casein did not prevent the disease. The idea that pellagra might be caused by a toxin, perhaps derived from moulds or other impurities in the maize eaten, has also been widely supported. Somewhat similar are the notions that the disease follows poisoning by dioxyphenylalanine (dopa) produced in the metabolism of maize and is amenable to treatment with sodium thiosulphate,[17 18 19] or that it is due to chronic cyanide poisoning and curable by sulphur compounds.[20] Yet another view, based on similarities between selenium poisoning and canine black-tongue, is that pellagra is a form of selenium poisoning.[21] None of these sug-

[1] *Trop. Dis. Bull.*, 1936, **33**, 729, 815, 885.
[2] Siegenbeek van Heukelom, A. (1937). *Nederl. Tidschr. Geneesk.*, **81**, 278.
[3] Trowell, H. C. (1937). *Arch. Dis. Childh.*, **12**, 193.
[4] Javicoli, J. (1937). *Quad. Nutrizione*, **4**, 1.
[5] Ellinger, P., Hassan, A., and Taha, M. M. (1937). *Lancet*, **2**, 755.
[6] Sydenstricker, V. P., and Armstrong, E. S. (1937). *Arch. intern Med.*, **59**, 883.
[7] Ellinger, P., and Dojmi, L. (1935). *Chem. Ind. Rev.*, **54**, 507.
[8] Ellinger, P., and Dojmi, L. (1935). *Lijecn. Vjesn.*, **2**, 6.
[9] Beckh, W., Ellinger, P., and Spies, T. D. (1937). *Quart. J. Med.*, New Ser., **6**, 305.
[10] Porter, W. B., and Higginbotham, U. (1937). *South. med. J.*, **30**, 1.
[11] Sydenstricker, V. P., and Thomas, J. W. (1937). Ibid., **30**, 14.
[12] *J. Amer. med. Ass.*, 1937, **108**, 853.
[13] Chick, H. (1933). *Lancet*, **2**, 341.
[14] *J. Hyg.*, Camb., 1921, **20**, 1.
[15] *U.S. Pub. Hlth. Serv. Ser. Hyg. Lab. Bull.*, 1920, No. 116.
[16] *Publ. Hlth. Rep. Wash.*, 1925, **40**, 54.
[17] Sabry, I. (1931). *J. Trop. Med. Hyg.*, **34**, 303.
[18] Sabry, I. (1932). Ibid., **35**, 164.
[19] Sabry, I. (1934). Ibid., **37**, 225.
[20] Clark, A. (1935). *W. Afr. med. J.*, **8** (No. 4), 7.
[21] De Rohan-Barondes, R. (1937). *Presse méd.*, **45**, 188.

gestions has received adequate experimental or clinical confirmation.

The view accepted at present is that pellagra is a deficiency disease caused by lack of the vitamin B_2 complex. Two new variations on this theme are now under discussion. Sydenstricker and his co-workers[22] state that pellagra can be cured simply by the administration of the gastric juice of healthy individuals. They conclude that pellagra is due partly to loss of the power to produce an intrinsic factor, secreted with the gastric juice and stored in the liver, and partly to the lack of an extrinsic factor, vitamin B_2, in the diet. Stannus[23] considers the action of the anti-pellagrous factor in the diet to be that of a catalyst governing the metabolism of the cells of the skin, mucous membranes, and nervous system—an explanation somewhat difficult to follow. Quite different is the view advanced by Ellinger and others, after observing that rats deprived of the constituents of the vitamin B_2 complex excrete in the urine a highly concentrated coproporphyrin, which disappears after these substances have been added to the diet.[24] Clinical investigations along the same lines showed increased porphyrin in the urine in cases of "endemic" pellagra in Posusje, Jugoslavia, in "alcoholic" pellagrins in Cleveland, Ohio, and in Egyptian pellagrins. The porphyrin output appeared to be greatest before or at the onset of the disease and to decrease for a time while the clinical symptoms were developing; it usually disappeared after treatment with substances rich in vitamin B_2. Porphyria is thought to be an essential symptom of pellagra, and to cause the characteristic dermatitis by rendering the skin sensitive to light and pressure. The connexion between the dermatitis and exposure to sunlight has also been demonstrated by Smith and Ruffin.[25] The lack of vitamin B_2 causing pre-pellagrous porphyria may be due to malabsorption or malnutrition, or both; but once the pre-pellagrous state is established hard physical work, especially in the open air, exposure to sunlight, or the occurrence of infectious disease will precipitate the symptoms of pellagra. The clinical similarity of pellagra and congenital porphyria has also been stressed.

Treatment of pellagra has been advanced by the use of yeast, which reduced the death rate of pellagrins in Georgia from 33.7 per cent. before 1926 to 25.3 per cent. in the following nine years. Complete rest in bed, a diet containing as much as 4,500 calories, and the simultaneous administration of large daily doses of dried yeast or liver extract has given striking results.[26] Ruffin and Smith,[27] investigating the pellagra-preventive dietary factor postulated by Goldberger and others,[28 29] conclude that this factor in liver extracts consists of two or more substances. Ellinger, Hassan, and Taha[30] observed cure or improvement in pellagrins following the oral administration of dried yeast or an autoclaved watery extract of yeast, without any other alteration of the diet or conditions of life. The fuller's earth adsorbate of the watery extract of yeast which Goldberger and Wheeler[31] found effective in the prevention of black-tongue, believed to be the canine equivalent, gave no decisive results in human pellagra. An eluate prepared from the fuller's earth adsorbate gave promising results, as did the filtrate from this adsorbate when given with lactoflavine. These substances were prepared according to the methods of Edgar and Macrae,[32] who tested them on growing rats deprived of vitamin B_2, and found them to possess growth-promoting activity. The activity of the fractions isolated has been tested in most instances on rats or dogs, and the application of the results to human pellagra is difficult and uncertain in the present state of knowledge. Much confusion exists owing to the different sources (yeast, liver, rice, bran, etc.) from which various fractions have been isolated and to the lack of a uniform nomenclature for them.

A further complication has been introduced by Leutsky,[33] who suggests that there is reason to seek the cause of pellagra-like lesions in mice in an insufficiency of mineral components in an otherwise adequate diet. In the treatment of canine black-tongue Elvehjem and his co-workers[34] found nicotinic acid of value and isolated nicotinamide from highly active liver concentrates. If these results are confirmed and nicotinic acid is found equally effective in the treatment of human pellagra, as seems to be the case from the results recently published by Fouts and others[35] and by Smith, Ruffin, and Smith,[36] it will be interesting to see whether the consumption of trigonellin, the methylbetaine of nicotinic acid, has any influence on the development of pellagra in Lower Egypt. Trigonellin is contained in "helba," the seed of *Trigonella foenum graecum*, which is a common constituent of the bread eaten by the rural population of this district, where pellagra is endemic.

[22] *Amer. J. med. Sci.*, 1936, **192**, 1.
[23] *Trop. Dis. Bull.*, 1937, **34**, 183.
[24] Ellinger, P., Edgar, C. E., and Lucas, N. S. (1935). *Chem. Ind. Rev.*, **54**, 269.
[25] *Arch. intern. Med.*, 1937, **59**, 631.
[26] Spies, T. D., Chinn, A. B., and McLester, J. B. (1937). *South. med. J.*, **30**, 18.
[27] *South. med. J.*, 1937, **30**, 4.
[28] *Publ. Hlth. Rep. Wash.*, 1926, **41**, 1025.
[29] Ibid., 1926, **41**, 297.
[30] *Lancet*, 1937, **2**, 1188.
[31] *Publ. Hlth. Rep. Wash.*, 1928, **43**, 172.
[32] *Biochem. J.*, 1937, **31**, 886.
[33] *Lancet*, 1937, **2**, 1421.
[34] *J. Amer. chem. Soc.*, 1937, **59**, 1767.
[35] Fouts, P. J., Helmer, O. M., Lepkovsky, P., and Jukes, T. H. (1937). *Proc. Soc. exp. Biol. N.Y.*, **37**, 405.
[36] *J. Amer. med. Ass.*, 1937, **109**, 2054.

ALL THE WORLD A LABORATORY

An exhibition of scientific instruments, arranged by the Physical Society, attracted a large number of visitors to the Imperial College of Science, South Kensington, during the first week of January. It was divided into a trade and a research and educational section, but really the dividing line between the two sections was not very clear, because many trading firms are themselves carrying out important and far-reaching pieces of research. The relatively few instruments which had a medical interest were microscopes and other laboratory and class-room apparatus, hearing aids and acoustic measuring equipment—very much in evidence—long-wave diathermy apparatus, and an instrument called the "theracoupler" for raising the body temperature of patients by electro-magnetic induction. This instrument, which was exhibited by Marconi-Ekco Instruments Ltd., is intended for use either in general fever therapy or for localized disabilities. The oscillatory inductance takes the form of a flexible cable which may be wound around a limb or joint, looped over or under the body, or applied in the form of a pancake coil. The National Physical Laboratory showed a selection of the instruments used in its optical work, illustrating the routine tests it undertakes for a number of public bodies. One problem now being investigated is the effectiveness of the mercury and sodium discharge tubes which are increasingly used for street lighting. The question many people ask themselves is whether the colour is more effective than the white light for enabling the eye to detect objects on the roadway. Cinematograph records are being made of the manner in which uninstructed observers react to the different lights, the time they take to detect each of a number of objects being automatically recorded. The interest taken in noise control was shown by the number of sound-measuring instruments on view. One "noisemeter" was shown, a portable construction with a microphone, giving a direct reading in phons of the noise level in a vehicle or a factory or wherever it might be taken. The science of noise measurement appears to be established, but it is not entirely within the physicist's province to secure noise reduction. Another instrument that might perhaps be put to useful purpose was a volume indicator, to maintain at the appropriate level of audibility and comfort the loudness of reproduced speech and music in public places. An instrument shown for the first time was a gas-detection apparatus, the result of some work in which the Chemical Defence Research Department has been co-operating with the Department of Scientific and Industrial Research. It consists of a hand pump with a holder in which prepared test papers can be clamped. The suspected atmosphere is aspirated through the test paper and the stain produced is compared with standard colour charts. It was stated that concentrations of carbon monoxide of 0.2 per cent. can be detected in less than two minutes, and concentrations of 0.05 per cent. in six minutes. A new system of recording vibrations, accelerations, and the like was exhibited by the Cambridge Instrument Company in what they called "stylus-on-celluloid." The line produced by the stilus is so fine and smooth that when optically magnified readings accurate to about one-thousandth of a millimetre can be made. The recording is carried out in such a way that records taken over long periods occupy little space, are immediately available for inspection and measurement by using a simple form of microscope, and can be photographically enlarged.

PROPHYLAXIS OF MEASLES

Measles now ranks with diphtheria as a fully controllable disease, though the method of control is totally different and the only form of immunity which can be produced artificially is passive. What is perhaps more important than the fact that immune human serum will completely prevent an attack if given during the first five days after exposure to infection is the possibility, by reducing the dose or by giving it between the sixth and ninth days of the incubation period, of securing a mild attack which will confer permanent immunity. The day of the "measles tea-party" is returning, and deliberately to expose children to infection when a suitable opportunity occurs, and then by the appropriate use of serum to reduce the consequent attack to the level of German measles, would appear to be the ideal method of dealing with this disease. Deliberate exposure removes uncertainty as to the date of infection and enables the prophylactic dose and the time of its administration to be calculated with confidence in the result. The most potent serum is that obtained from convalescent donors within a few weeks of the attack, but the protective antibody persists throughout life and the serum of adults who have had the disease in childhood is effective. A quantity of blood such as is removed for transfusion may yield enough serum to secure a modified attack in from twenty to fifty children, according to their age and the time relations of its administration. An added advantage of this method is that human serum is free from all the drawbacks of therapeutic sera prepared in horses: it neither causes serum sickness nor sensitizes to further doses. It is in fact a most valuable therapeutic agent, and to render it more generally available will be an important service to the community. A recent report by Brincker and Gunn[1] gives details of the present sources of supply. The only product commercially available is obtained from placentas, and, according to this report, is liable to cause reactions; other sources are mainly local health authorities in London and a few other cities, which place restrictions on use of their stocks. The authors recommend that a serum pool be formed for use by members of the Medical Officers of Schools Association. There are doubtless many other attempts in progress to meet this demand on a smaller scale. It should be within the capacity of many laboratories to prepare serum for this purpose, and the organization of supplies for local use is a task which public health authorities might well undertake more generally. Where such facilities exist there is a corresponding obligation on the practitioner

[1] *Ann. Rep. Med. Off. Schools Ass.*, 1936, p. 92.

to use the serum to the best advantage. Every case in which the date or the fact itself of exposure to infection is in doubt has to be judged on its own merits, but two indications are quite clear: that serum is wasted if given after the attack has begun, and that absolute prevention of an attack should be sought for only in infants or in children who by reason of other illness are unfit to undergo even a modified attack.

SCHOLARSHIPS AND GRANTS FOR RESEARCH

The *Supplement* this week (p. 34) contains an announcement of the five scholarships which the British Medical Association awards annually and for which it is prepared now to receive applications. The value of the scholarships, which are tenable for a year, is £200 each in the case of the Ernest Hart Memorial Scholarship and the Walter Dixon Scholarship, and £150 for each of the other three. Grants to assist research are also made annually, and both scholarships and grants are awarded by the Council of the Association on the recommendation of its Science Committee. Applications for scholarships and grants should be made on forms prescribed for the purpose, which are available on request, and should reach the Secretary of the Association not later than May 7, 1938.

EFFECTS OF TEMPORARY CORONARY OCCLUSION

Following upon the recognition of certain changes in the electrocardiogram after myocardial infarction, many examples of changes similar in type, if less in degree, were reported in angina of effort. The changes in the latter, like the pain, lasted only a few minutes, but it is believed that functional changes, due to a temporary ischaemia, occur in the muscle during this time, and that with the return of a normal balance between work and blood flow the pain and the metabolic changes disappear. It is known that myocardial infarction may arise with widespread narrowing of the coronary branches but without complete occlusion of any vessel; but it is not certain whether the periodic increases of chronic ischaemia, expressed as attacks of effort angina, are a factor in the production of infarction in these cases. Some animal experiments to determine the electrocardiographic and other effects of temporary coronary occlusion have been made by H. L. Blumgart *et al.*,[1] the anterior descending branch of the left coronary being occluded in cats for periods of five to forty minutes. In all the animals where the occlusion was from fifteen to forty minutes the tracings showed the changes of infarction, and these persisted till the animals were killed—that is, for periods up to nine days. With occlusion for less than fifteen minutes these changes did not always occur, and when they did persisted a shorter time. In no case was any gross or microscopical evidence of infarction discovered in the hearts, and it was shown that the circulation through the occluded vessel was fully re-established after removal of the ligature. During the experiments ventricular fibrillation was often noted; the onset of this arrhythmia was most frequent at the release of the ligature and, secondly, just after its application. The mechanical trauma which would take place at these times may possibly explain this. There are doubtless clinical counterparts to these results. Cases have been recorded in which an apparently sound clinical diagnosis of myocardial infarction confirmed by electrocardiogram has not been borne out by post-mortem examination. Anginal pains of a duration comparable to that of Blumgart's experiments occur in the varieties known as angina decubitus and spasmodic angina, and are held to be independent of infarction. Also, progressive changes in the T waves are often seen in patients who give a history of nothing more than angina of effort. In all of these groups it is possible that chronic progressive changes in the electrocardiogram may appear and in some be indistinguishable from those of myocardial infarction. Increasing knowledge of these conditions will probably show that the present-day tendency is to diagnose cardiac infarction too readily.

[1] *Amer. J. med. Sci.*, 1937, **194**, 493.

LEAD ENCEPHALITIS IN CHILDREN

Lead poisoning is usually considered to be an industrial problem, and the development of public health services, with their influence on industrial medicine, has resulted in a great decline in the number of workers who contract this occupational disease. Of the protean manifestations of lead poisoning none is more serious or irrecoverable than encephalitis, which is often fatal. This encephalitis may arise either in acute lead poisoning or in chronic cases. The nature and pathology of lead encephalitis in adults have long been recognized, but little has been known about its occurrence in children until recently, when an outbreak of lead poisoning in small children caused by chewing furniture and toys coated with lead paint stimulated interest in this subject in the United States. Whether such cases occur in this country and escape recognition, or whether British children have less depraved appetites than their American cousins, cannot be determined at present. All that can be said is that in Great Britain lead encephalitis is a very rare diagnosis in children. That it is not uncommon in the United States is proved by the fact that Blackman[1] was able to study the pathology of the brain in twenty-two fatal cases of lead poisoning in children between the ages of 13 months and 7 years. Most of these cases were in coloured infants, but five were in white children. Evidence of lead poisoning was available in every case, both from the history and from the clinical picture. On naked-eye examination the brains appeared highly oedematous and pale. Microscopically, lesions were found throughout the nervous system, but were most abundant in the cerebral hemispheres and in the cerebellum. Most of the damage to nervous tissues resulted from changes in the small cerebral vessels, the permeability of which

[1] *Johns Hopk. Hosp. Bull.*, 1937, **61**, 1.

was increased, so that much serous exudate escaped into the tissues. Blackman considers that the formation of this exudate is characteristic of lead encephalitis, as the picture which results from its formation has not been observed in any other type of encephalitis. The exudate causes distortion of the architecture of the brain, the regions in which exudate collects showing destruction of nerve cells and fibres, with overgrowth of neuroglial fibres around the cells that have been destroyed. During fixation of the brain some of the exudate escapes into the fixing fluid, leaving large spongy areas in the brain, especially in the grey matter and in the apical white matter. Similar lesions are found in the cerebellum, particularly in the molecular layer, the Purkinje layer, and in the dentate nucleus. Small perivascular haemorrhages and focal areas of necrosis are common but are not specific. Special stains are recommended for demonstration of the exudate. A point of particular interest was that most of the children developed encephalitis and died during the summer—nineteen out of the twenty-two cases succumbed during the hottest time of the year. The suggestion is made that the high seasonal temperatures, which cause vasodilatation, may possibly precipitate the onset of encephalitis by acting on vessels already weakened by the toxic effects of lead.

THE JOURNAL OF NEUROLOGY AND PSYCHIATRY

The first issue of the *Journal of Neurology and Psychiatry*, dated January, 1938, has been published this week by the British Medical Association. As it is the lineal descendant of the *Journal of Neurology and Psychopathology* the aim of the editors is to uphold the traditions, character, and standard handed down by the late Dr. Kinnier Wilson. The present number contains original papers dealing with various aspects of neurology and psychiatry and a critical review of the pathology of apoplexy. It has been decided to replace the editorial article of the previous journal by an authoritative critical survey of some particular subject. The choice of subject under review will be guided largely by the type of work being carried out at various hospitals and centres of research. In this way it is the desire of the editorial committee to keep readers abreast of the latest additions to knowledge in neurology and psychiatry. To aid in the same purpose, each issue will also include an epitome of current literature in which the contents tables of recently published numbers of journals devoted to these branches of medicine are reproduced, along with short abstracts of articles of special interest. Appreciating the need for keeping in touch with the basic sciences, the scope of the epitome will embrace journals of anatomy, physiology, and biochemistry. The critical reviews and the epitome should be of much value to neurologists and psychiatrists throughout this country, the Dominions, and the United States, because there is at present no adequate service in the English language for bringing to their notice in compact form work which is going on in the world. To assist Dr. E. Arnold Carmichael in editing the *Journal of Neurology and Psychiatry* a board has been set up consisting of Dr. D. E. Denny-Brown, Mr. Geoffrey Jefferson, Dr. Aubrey Lewis, Dr. R. A. McCance, and Dr. Alfred Meyer. The medical public is thus assured of a quarterly periodical of high standard which, with its new typography and lay-out, deserves the support of neurologists and psychiatrists in all parts of the British Empire. It is not too sanguine to expect that, with the standard set by the editorial board in this first number, our contemporary, under a new name and a wider policy, will become recognized everywhere as being authoritative and invaluable to those engaged in the study and practice of the subjects covered by its title.

WORKMEN'S COMPENSATION FOR SILICOSIS

The group of pulmonary diseases known as silicosis attack a large number of workmen in countries where much mining is done in siliceous rock. The problem of silicosis was one of the first to be dealt with by the International Labour Office at Geneva, which has published a considerable body of literature on its researches. The International Stoneworkers' Secretariat has for long pressed the Office to help it to obtain compensation in all countries for silicosis, and in the course of its investigations the Office has examined the compensation legislation in force in various countries. This legislation mostly falls within three typical systems: special legislation, special schemes within workmen's compensation legislation, and schedule. These are represented by practice in Great Britain, South Africa, and Germany respectively. In a recent report on workmen's compensation for silicosis in the Union of South Africa, Great Britain, and Germany[1] the Office has analysed these systems of law according to a uniform plan, and compared the results. In a series of appendices it gives an account of the system of blanket coverage and its practical application, data connected with radiological technique and terminology, enumeration of products used and of industries, statistics of incidence and cost of compensation, and a list of countries which have introduced compensation.

THE HALF-YEARLY INDEXES

The usual half-yearly indexes to the *Journal* and to the *Supplement* and *Epitome* have been prepared and will be ready shortly; they will, however, not be issued with all copies of the *Journal* but only to those readers who ask for them. Any member or subscriber who wishes to have one or all of the indexes can obtain what he wants, post free, by sending a postcard notifying his desire to the Secretary, B.M.A. House, Tavistock Square, W.C.1. Those wishing to receive the indexes regularly as published should intimate this.

[1] International Labour Office. Studies and Reports. Series F (Industrial Hygiene), No. 16. Workmen's Compensation for Silicosis in the Union of South Africa, Great Britain, and Germany. Geneva, 1937. Price 3s. 6d. Published in the United Kingdom by P. S. King and Son, Ltd., Orchard House, 14, Great Smith Street, Westminster, S.W.1.

SURGICAL PROCEDURES IN GENERAL PRACTICE

This is one of a series of articles contributed by invitation

TREATMENT OF WOUNDS—I

BY

W. H. OGILVIE, F.R.C.S.

The aim of wound treatment is the restoration of perfect function: to attain this end the wound must be made to heal in the shortest time, with the least alteration in its structures by the processes of repair.

The Process of Repair

The ideal progress of a wound is, or should be, seen in the healing of a surgical incision. An operation wound differs in several particulars from the majority of accidental wounds: first, it is executed with sharp instruments, used in their cutting plane only, and the damage to tissues along its margin is therefore slight; secondly, there is no loss of substance; thirdly, haemorrhage has not been allowed to take place; and, fourthly, infection is absent or minimal. After suture the first change that takes place in such a wound is the outpouring of fluid between the apposed cut surfaces. Into this fluid and between these surfaces phagocytes wander, and proceed to engulf and remove damaged cells—in the case of a clean wound to a depth of a few cells only. The fixed connective-tissue cells of the part multiply and bridge the gap, and on the surface the epithelial cells do the same. After four days the epithelial wound if linear is covered with fresh cells, and the deeper parts are bridged by new connective tissue. After ten days the wound is mechanically very nearly as strong as the normal parts on each side of it, but the newly united tissues are more cellular and vascular. By the end of six weeks mature connective tissue has replaced the fibroblasts and repair may be looked upon as complete.

In traumatic surgery an imperfect result may be due to the nature of the wound alone, the process of healing having proceeded normally, or to permanent interference with the function of the structures in the neighbourhood of the wound due to delayed or imperfect healing. In the first case there has been actual loss of substance which cannot be replaced, and the resulting disability will depend upon the extent and importance of the tissue lost. We can do nothing to mitigate or to prevent this loss. In the second case repair has been by second intention—that is, it has passed through an intermediate stage of granulation. Granulation tissue is not in itself vicious. It is Nature's method of dealing with a dead space, the putty she puts into imperfections before finishing off. Granulation tissue must therefore be expected where the loss of substance has been too great for the tissues to be approximated by suture; where approximation, though possible, has been imperfectly performed; or where it has been broken down later by haemorrhage or infection. The evil of granulation tissue is that it is finally replaced by a fibrous tissue which contracts to approximate the margins of the defect it originally filled. Its purpose is to bind, fix, and repair; its vice that this fixity destroys movement. The skin over a granulated scar is thin, fixed, prone to break down with friction, and liable to keloid or even malignant changes later; muscles are weakened in proportion to the gap in their fibres, and bound to each other by adhesions; tendons become fixed to their neighbours and their sheaths; nerves regenerate poorly if at all.

If our ideal is to be the approximation of healthy tissues without infection we must, in each case that presents itself, assess both the mechanical and bacteriological condition of the wound. From one point of view wounds may be classified as punctured, incised, lacerated, crushed, or complicated by injury to bones, joints, or nerves. From the other they fall into the categories of clean or infected. The two are not really independent, for wound infection depends not alone upon the entry of bacteria but on the presence of dead or damaged tissues upon which they can thrive and establish a foothold. In general, clean-cut wounds are more likely to be bacteriologically clean than lacerated ones, but this is by no means always the case; among the most dangerous are the small punctures caused in hospital work by infected needles.

Contamination and Infection

The progress of a wound infection may be divided into two somewhat arbitrary stages—contamination and infection. In the first stage the bacteria which have been carried in by the agent inflicting the wound lie on its surface—in bits of dirt, clothing, or metal fragments—or in small groups in the blood clot. They are a local contamination and have not yet started to multiply or invade. They can, at this stage, be removed by a thorough mechanical cleansing, leaving the tissues round them uninfected. In the second stage the bacteria, profiting by the supply of culture medium available to them in the dead matter around, in blood clot, lymph, and damaged muscle, have multiplied and started to invade the tissues of the host. They can now be removed only by the protective reaction of the living cells, or by some wide excision which necessitates the removal of healthy tissues, and involves the risk that it may injure the defence wall without including in its scope all the invaders. For practical purposes the stage of contamination may be looked upon as lasting for twelve hours before it passes into that of infection. It must be remembered that where the organisms introduced are few, the available pabulum scanty, and the tissues around healthy, infection may never establish a foothold.

An estimation of the probable degree of infection is the first step in deciding upon the treatment of any wound. This will take into consideration the nature of the instrument, the state of the patient's skin and clothes, and the appearance of the wound, and will be no more than a working guess based upon experience, but a guess upon which treatment must be decided. If the wound is clean it should be sewn up completely; if infected, it should be drained. When there is any doubt undue pessimism is safer than mistaken optimism.

First-Aid Measures

These should be of the simplest character and confined to absolute essentials—the arrest of haemorrhage and the protection of the part from infection and further damage. They are only necessary when some complication is urgent and when the interval in time or space before permanent treatment can be undertaken is appreciable.

Haemorrhage can usually be arrested by local pressure—the application of a first-aid dressing with a firm bandage over it. Under the conditions implied by first-aid, when the dressings are from a stock packet sterilized some time previously and there are no facilities for boiling instruments or adequate preparation of hands, opening the wound or packing its depths should be avoided. Should this seem essential for life-saving, the packing gauze, if possible, should be wrung out of an antiseptic. For severe haemorrhage from a limb a tourniquet provides a certain method of arrest, one far safer than packing under doubtful conditions. A tourniquet should not be left on the arm longer than half an hour if it can be avoided, and in no case longer than an hour; in the leg these times may be doubled. In the arm the dangers of a tourniquet are not alone those of tissue necrosis following prolonged ischaemia; paralysis of some of the nerves, usually temporary but occasionally persisting as a partial weakness, is to be feared even after a short application of any band of a rigid type. Here it is safer to use the cuff of a sphygmomanometer.

Tincture of iodine is universally painted over wounds as a first-aid measure. That this practice should be retained in ambulance classes is probably wise; the use of iodine discourages meddlesome exploration, resterilizes dressings which have often been desterilized in application, and brings a visible and pungent reminder of the value of antisepsis. When a really sterile dressing can be applied with careful technique iodine is better omitted. In a fresh wound it is extremely painful, and to one whose nerves have been upset by a recent accident very distressing, while its sterilizing action is limited to the skin and the dressings and does not extend appreciably to the depths of the wound, the proteins of which are coagulated by the alcohol. When haemorrhage has been arrested and a clean dressing applied the part should be fixed on a splint or otherwise protected from avoidable movement.

General Treatment

As soon as the patient reaches a place where adequate treatment can be instituted—his house or the doctor's, a nursing home or hospital—a more careful study of him and his injury must be made. We must ascertain as far as possible the extent of the wound, the degree of contamination, and the structures that have been injured. This examination may mean gently lifting up the flaps of the wound with forceps and cautious probing, but any forcible separation of the parts, anything that may hurt the patient or restart the haemorrhage, should be postponed till an anaesthetic has been given. At this stage a careful search will be made for nerve and tendon injuries and for fracture of neighbouring bones. Such a survey will allow us to decide whether the general condition of the patient demands treatment for shock or whether we may proceed to repair the wound at once; whether an anaesthetic is necessary, and if so of what nature; what structures are certainly damaged and need repair; and if infection is to be feared, particularly infection by some of the more dangerous organisms.

It is rarely that treatment for shock is essential before the wound can be repaired, and then only if it appears reasonably certain that active haemorrhage plays no part in the shock. Because of the difference outlined above between contamination and infection it is really important that the surgical toilet of the wound shall be delayed as little as possible and that bacteria should not be allowed to establish a hold. The treatment of shock by warmth and the administration of fluids can in most cases be carried on while the wound is being repaired. If necessary a local anaesthetic can be given.

Preventive Therapy

While infection may be present and is to be feared in any wound, there are three organisms whose presence can often be anticipated and whose ravages can be forestalled—the bacillus of tetanus, the bacillus of gas gangrene, and the haemolytic streptococcus. The bacilli of tetanus and gas gangrene are both found in the alimentary flora of farmyard animals, and therefore in stables and on all manured land, on the surface of roads, and in the clothing of those who work in gardens or with horses or cattle. Either bacillus may gain entry to wounds incurred in such surroundings or by people in these occupations; but whereas the tetanus bacillus will establish itself wherever anaerobic conditions are found, the *Cl. welchii* rarely gains a foothold except in the presence of grossly devitalized tissues. A prophylactic dose of 1,000 English units of antitetanic serum (2 English units correspond to 1 U.S.A. unit) should be given in all cases of road or farm accidents, and indeed in every case of a lacerated wound where soiling is at all possible; a prophylactic dose of 4,000 units of anti-gas-gangrene serum should be given in addition where soiling and laceration coexist.*

Infections with virulent strains of haemolytic streptococci are rarely encountered, except in wounds inflicted in hospital practice. In pricks or scratches incurred during necropsies, or while operating on or dressing septic cases, they may almost be anticipated, and are notoriously dangerous and even fatal. In such cases a prophylactic dose of sulphanilamide should be given.

Anaesthesia

The question of anaesthesia demands little discussion. Trivial wounds, and occasionally larger ones in phlegmatic adults, may be stitched without anaesthesia. If the patient has not to make a journey afterwards a preliminary injection of morphine may be given to allay apprehension. In most cases a general anaesthetic will be found advisable, since it leaves the surgeon free to extend his procedures in time or space, and it is almost essential if a tourniquet is to be applied or haemorrhage is anticipated. Local anaesthesia is particularly applicable to wounds below the knee and elbow. The method of local infiltration is not really suitable for the repair of wounds, and some form of nerve block will be preferred. Fortunately the median, ulnar, and radial nerves at the elbow and wrist, and the internal and external popliteal and long saphenous nerves at the knee, run in easily identified anatomical sites, and may be blocked by injection with 1 per cent. novocain. Local anaesthesia is indicated when the wound is part of an injury that includes fractures of the ribs, since pulmonary complications may follow general anaesthesia, however carefully administered.

Operative Treatment

The aim of the surgeon is to suture healthy, uninfected tissues as accurately as possible. When the wound has been inflicted with a clean sharp instrument, the tissues on its surfaces are undamaged, and the edges of skin and deep layers clean-cut, the wound may be sewn up completely after gentle irrigation with a harmless antiseptic,

* Many surgeons now give a mixed tetanus and gas-gangrene antitoxin in all road and industrial accidents: this is prophylactic against infection by *Cl. tetani*, *Cl. welchii*, and *Vibrion septique*.

such as 1 in 1,000 acriflavine, and the arrest of all bleeding and oozing points. Such an apparently clean wound almost necessarily contains organisms; but these, if small in number and of low virulence, will be exterminated by the healthy tissues around them if no circumstances favourable to them, such as the accumulation of exudate or the presence of foreign material, are allowed to appear. Dead spaces must be eliminated, so the wound must be sutured to its depth; it is not sufficient to approximate the skin. For the deep sutures catgut of small calibre should be used, but used sparingly. Size 00 is usually sufficient, and the sizes larger than 1 are seldom needed, being bulky and irritating to the tissues rather than strong. For the skin unabsorbable sutures of horse-hair or fine silkworm gut are best. An ideal material is the suture of 00 ophthalmic silkworm gut, which is supplied by most firms in sterile tubes for plastic work, on fine eyeless cutting needles. These sutures can be inserted almost painlessly without anaesthesia and leave no visible scar when removed. All stitches in deep structures or skin must be interrupted to allow any fluid accumulating to escape between them, and beyond this precaution drainage is unnecessary in the clean type of case under discussion. If, on the other hand, the wound is lacerated and soiled it must be trimmed and cleansed before it can be sutured, and even then it should not be closed completely unless the excision has been wide and early; usually drainage of some kind must be allowed.

Such a wound is first opened freely and its depths inspected. Loose blood clot, dirt, and fragments of clothing are removed, and the cavity is lightly sponged out with gauze swabs. If bleeding from a vessel of some size is then encountered it must be stopped; otherwise the arrest of haemorrhage should be left till obviously damaged tissues have been excised. Excision is carried out methodically and carefully from the deeper to the more superficial layers. The torn surface of muscle should be trimmed with scissors to the depth of a few millimetres. Vessels and nerve trunks must of course be left, and can only be cleansed in so far as swabbing with an antiseptic will do it. In most lacerated wounds the subcutaneous layer appears to be most soiled and must be methodically trimmed, care being taken, however, to remove only as much as is badly damaged, and not to interfere with the blood supply of the skin flaps. Skin should be removed very sparingly, the bruised edge alone of the flaps being cut away with a sharp knife.

Haemorrhage should be arrested, where possible, by ligature of the bleeding point. After the excision of bruised tissue the point of emergence of the jet of blood from the clean surface should be seen comparatively easily, and the point can be picked up with artery forceps and ligatured. If excision has been done under a tourniquet the vessels appear as the band is loosened. Blind diving for bleeding points that cannot clearly be seen is to be deprecated, for arteries and nerves usually run together, and the nerve may be seized with, or instead of, the vessel. Ligature of large masses of tissue should also be avoided, as being liable to lead later to sepsis. While the actual bleeding point should be picked up and tied, under the conditions of poor light, inadequate assistance, and inefficient anaesthesia in which wounds often have to be treated such a course may be unwise. Bleeding may continue, and its source appear to lie deep in an interosseous space or near some important structure, where the operator is unwilling to adventure under the circumstances prevailing. Here packing offers an alternative method of arrest, and one that is immediately effective, though ultimately far less certain than ligature. In the type of case being discussed a packed wound inadequately excised is almost certain to become infected to some degree, and secondary haemorrhage, demanding ligature of the main artery to the part at a distance, is very likely to follow at any time in the ensuing ten days. When a wound has been packed to arrest bleeding the pack should be removed two or three days later, a second pack being ready for immediate insertion should the bleeding restart.

Drainage and Delayed Primary Suture

A wound lacerated and soiled enough to require excision can rarely be sutured up completely. In most cases a small drain, preferably a length of corrugated rubber or a strip cut from a surgical glove, should be put down to its depth and brought out between two stitches. The drain can be removed as soon as lessened discharge and normality of temperature and pulse show that there is no infection in the depth of the wound; if it comes out within forty-eight hours the cosmetic result will be that of an undrained wound without its risks. In small wounds a very satisfactory temporary drain can be made by a wisp of six to ten strands of silkworm gut laid side by side, some or all of which can be removed as the wound clears up.

If the excision has been incomplete or if the wound has been grossly contaminated, and in all cases of large and dirty lacerations repaired later than twelve hours after infliction, it is better to pack the wound at first, or at most to close it in part only. The method of "delayed primary suture," used with success in the war, is particularly applicable to these dangerous cases. The wound is excised, and after haemorrhage has been arrested it is carefully packed with strips of gauze soaked in 1 in 1,000 acriflavine, care being taken that all recesses are filled and that no pockets remain in which serum can accumulate. The abortion of infection is judged by the general condition of the patient, the state of his temperature and pulse, the absence of pain, and the normal appearance of the parts around the dressing. If these indications are satisfactory the packing is removed after two or three days under general anaesthesia, and if the wound appears healthy its sides are brought together over a small drain with catgut mattress sutures for the deeper parts and interrupted silkworm-gut stitches for the skin.

After suture the wound is dressed with sterile gauze and wool and bandaged firmly enough to keep the deep layers apposed and discourage oozing. The injured part must be kept immobilized for at any rate the first week after suture. This may imply rest in bed, confinement to the house, a sling, or, in many cases, a splint. Rest is essential to prevent effusion, aid repair, and assist the tissues to overcome infection. It is far better overdone than omitted. For these reasons a splint is often advisable to immobilize the whole of an involved limb segment and, in some cases, to maintain a position which relaxes the sutured planes.

(*To be continued*)

The Medical Society of Evian is organizing a second congress on renal insufficiency, which will take place at Evian from September 21 to 24, under the presidency of Professor F. Rathery. Titles of papers to be read at the congress should be sent to the secretaries, Dr. F. P. Merklen and Dr. M. Derot, before July 15. All communications or inquiries should be addressed to the Secrétariat du Congrès, 138, Avenue des Champs-Elysées, Paris, 8ème.

CROYDON TYPHOID INQUIRY

CLOSING PROCEEDINGS

The Croydon Typhoid Inquiry reached its final stage at the beginning of the present week. It had extended over sixteen days. The evidence on behalf of Croydon Corporation was completed by the calling of the town clerk, Mr. Ernest Taberner, who, in reply to Mr. A. H. Forbes, for the Croydon Division of the British Medical Association and the Local Medical and Panel Committee, said that his council favoured co-operation with local medical practitioners, though it had not exercised the powers of co-option afforded by the Local Government Act, 1933. He had no doubt that as the result of the present proceedings it would take the suggestion into consideration. He thought that it would not have been feasible at the beginning of a serious outbreak for the medical officer to take himself away from his work and set up a body of medical practitioners for the purpose of co-operation.

Dr. O. M. Holden, the medical officer, who was recalled, said in reply to Sir Humphry Rolleston that he began to be concerned about the cases on October 30, when four cases had been notified and two others were suspected. The infection of the Addington well by a typhoid carrier was in his view the most probable cause of the outbreak, though he agreed with the chairman that this did not imply any wilful misconduct on the part of the carrier or any other person.

Evidence by Residents

A number of witnesses were presented by Mr. A. M. Lyons on behalf of the South Croydon Typhoid Outbreak Committee. Among these was Mr. R. L. Moss, secretary of the committee, who said that at a meeting of residents on October 31 Dr. Holden had stated that water as a source of infection was "inconceivable." Another witness was a local councillor, Mr. S. A. Maycock, who said that he as a councillor received no information of the outbreak until November 9, when an official statement was made to the council at the mayor-making ceremony. Mr. Maycock added that his son had been a typhoid patient, but was now recovering. Asked whether he was in hospital, Mr. Maycock replied, "No, emphatically not; we kept him at home." Other witnesses included a hotel proprietor, a local schoolmaster, the matron of a nursing home, and Mr. C. R. Rimington, whose son was taken ill as early as October 24 and died of typhoid. On October 29, having heard of other cases in the road in which he lived, Mr. Rimington wrote to the medical officer of health mentioning these cases and stating that the only common thing appeared to be water. On October 30 he saw Dr. Holden and offered to place himself entirely at the medical officer's disposal in investigating the outbreak. He called an emergency meeting of local ratepayers on the following day, and it was at this meeting that Dr. Holden said, in reply to a question, that it was inconceivable that water was the cause.

The last of this series of witnesses was a typhoid patient, Mr. Cecil E. Green, who stated that he was taken ill on November 20 and removed to Mayday Hospital, which he had been allowed to leave for the first time on the day on which he gave evidence. He desired to take the opportunity of expressing his high appreciation of the medical, nursing, and domestic attention he had received at the hospital, against which, he understood, some adverse criticism had been directed. Mr. Lyons said that no such criticism had been made by those he represented, and he wished to dissociate himself from anything of the kind. Mr. Green confirmed the testimony of previous witnesses that at the meeting of residents on October 31 the medical officer was asked if he thought that water was the cause of the trouble, and replied that this was inconceivable, because the water was tested. He was asked at the same meeting whether it would not be a good idea to inform local practitioners of the outbreak, but Dr. Holden did not agree that at that time there was an outbreak, and that was one of the reasons why the residents were dissatisfied with the results of the meeting.

Sir William Willcox's Evidence

Sir William Willcox was also called by Mr. Lyons. He said that he desired to make certain statements in the interests of the public. The Croydon outbreak in his view was an epidemic of a rather serious form of typhoid, with clinical manifestations a little unusual. The mortality rate looked like being 15 per cent., which was fairly high. In reply to questions, he said that if there were five or six cases of typhoid in the same area, as was the case in Croydon by October 31, his suspicions would have been aroused, and his attention would first have been drawn to water and milk. In dealing with such an outbreak he would advise close liaison between the medical officer of health, the municipal authority, local medical practitioners, and the voluntary hospitals.

"I am not criticizing the medical officer of health for Croydon, but I do criticize the machinery which exists throughout the country to-day, and the lack of liaison between the general health and municipal authorities and general practitioners. There should be some *ad hoc* committee representing the medical practitioners of the district who can advise the medical officer if called upon and who can in turn be helped by the medical officer."

He quite agreed that it was the responsibility of the medical officer of health to deal with an outbreak, and that it would not be possible in the midst of such an outbreak for the medical officer himself to go round to all the local doctors. He added that he was of opinion that the cause of this epidemic was discovered very quickly. "It was a good piece of work. From a scientific point of view the diagnosis in this case was very quickly made." He was sure that Dr. Holden did everything possible to help the doctors. The outbreak was rather sprung upon him, and perhaps he did not realize the importance of the help that a committee might have afforded.

At the conclusion of Sir William Willcox's evidence Mr. Sandlands (for Dr. Holden) said that although he had previously stated that he would call a witness, he would not now do so in view of Sir William's commendatory observations regarding the medical officer.

Other Medical Evidence

Dr. George Lewin, who said that he had attended twenty-three cases during the present outbreak, urged that it was not enough merely to circularize the practitioners of South Croydon. All the practitioners in the borough and the surrounding districts should have been warned earlier, and a map of the water supply in relation to the occurrence of cases would have been of great assistance. Replying to the chairman of the tribunal (Mr. H. L. Murphy, K.C.) he said that had he been medical officer when the outbreak occurred he would have suspected water from the very beginning and have informed the practitioners—in confidence, if necessary—of the fact. The general practitioners bore the frontal attack in an outbreak of this kind, and the M.O.H. was the intelligence officer.

Dr. E. T. Conybeare, a medical officer of the Ministry of Health, who had assisted in Croydon from the beginning of the outbreak, answered some questions by the chairman. He thought that the coincidence between the dates on which the known carrier was working in the well and the probable date of infection in the majority of the cases pointed to the probability that this man was connected with the outbreak, though not the cause of it in the gross manner which had been indicated. He was of opinion that the incubation period in typhoid was longer than fourteen days. Dr. Macdonald Scott, bacteriologist at the Ministry of Health, gave evidence that his examination showed that one of the workmen was a

consistent carrier of *B. typhosus*. All his tests at the gathering ground had been negative.

In a final speech to the tribunal on behalf of the Croydon Division of the B.M.A. and the Local Medical and Panel Committee, Mr. Forbes said that it might have been wise at such a time to have recognized the Local Medical and Panel Committee as a body with which to co-operate. He hoped that medical men would in future be co-opted on the Public Health Committee. Mr. Forbes added:

"My clients are not here to make any attack on anybody. It is apparent to the tribunal, and must be to everybody, that the Croydon medical officer of health is a loyal, able, and industrious servant of the corporation, and it appears also that in the witness box he was a truthful and careful witness. Whatever I have to say by way of criticism of his views, it must not be thought by him or by anybody that it constitutes anything in the nature of an unfriendly attack or an attack of any description."

The Case for the Medical Officer of Health

The closing speech of Mr. P. E. Sandlands, K.C., for the medical officer of health, occupied the whole of one afternoon and the greater part of the next morning. He said that Dr. Holden had been medical officer for Croydon since 1928, and, before that, medical officer for two other important county boroughs. In the letter over the signatures of Lord Dawson and Sir Kaye Le Fleming he was referred to as "distinguished," and Mr. Forbes, counsel for the Croydon Division of the B.M.A., who came to the Inquiry as a critic, ended by being almost a partisan of the medical officer, whom he described as loyal, able, and industrious, and as a witness careful and truthful. The tribunal had seen him in the witness chair, and heard what he had done—or only part of what he had done, because there had been hundreds of duties in connexion with the outbreak which he had efficiently discharged and on which no comment was made—and he could not help feeling that the critical atmosphere in respect to Dr. Holden in which the Inquiry began had been considerably modified as it proceeded. He thought Dr. Holden must have impressed the tribunal with his modest demeanour and quiet efficiency.

What were the causes of the outbreak? Was Dr. Holden blameworthy in failing at first to localize the source or in dealing with it when localized? A medical officer of health had many statutory duties, but no statute had laid upon him the duty of looking after the water. The governing regulation read that "he must inform himself as far as practicable as to all matters affecting or likely to affect public health in the district and be prepared to advise the local authority on them." "As far as practicable" was a phrase like a concertina, which could be extended or compressed. The criterion of judgment was what the medical officer's predecessors had done and what he himself had done. He had never been summoned to the Water Committee. The borough engineer and the medical officer both had service agreements, and it was fair to suppose that the borough engineer was the senior officer; his remuneration indicated this unmistakably. But both were principal officers, and each was under an obligation to let the other know about matters affecting the other department. Dr. Holden in repelling criticism was not seeking to deflect it to anybody else. His impression of Dr. Holden was that he would rather take blame which was not clearly his than let a colleague suffer. He was not attacking the borough engineer or anybody under him. Dr. Holden had no special duty with regard to water, but he had from time to time inspected the gathering ground and had made recommendations to the borough engineer.

The most probable cause of the outbreak was the infection of the Addington well by a carrier working at the well. That was the opinion of Dr. Suckling and Dr. Conybeare. Against that was the opinion of Sir William Willcox that the cause of the outbreak was sewage from the gathering ground getting into the well through fissures in the chalk, but Sir William had not heard all the evidence. Was Dr. Holden to be held responsible for a carrier? He did not know that work was proceeding at the well. In fact nobody was to blame for this unhappy accident. If a medical officer of health was to be held responsible in such a case eligibility for such an office would require "a combination of the qualities of Solomon, the Archbishop of Canterbury, the heads of the Royal Colleges, and a veterinary surgeon." Dr. Holden had believed that chlorination was in progress. As long ago as 1930 he had suggested that chlorination of the Addington well should be considered. Mr. Sandlands desired to make it clear that the dose which Dr. Holden had recommended—namely, 0.05 part in a million—was simply a precautionary dose, to be increased when circumstances demanded. To double the dose would make the water more resistant from the point of view of other organisms, but not from the point of view of typhoid; when dealing with the typhoid bacillus the smaller dose was sufficient. The advice Dr. Holden had given with regard to chlorination was perfectly sound and had resulted, as the succession of analyses showed, in a most satisfactory water being supplied until the eve of the outbreak. Mr. Forbes had expressly exonerated Dr. Holden from any blame in this respect, and Sir William Willcox had said that from the scientific point of view the detection of the cause of the epidemic was a very good piece of work and a quick diagnosis.

The chairman said that there was no question of the tribunal differing from what Sir William Willcox had said on that point.

Potential Causes of Outbreak

Mr. Sandlands went on to urge that it was the business of the medical officer, faced with an outbreak, to consider all possible causes; only by elimination could he arrive at the actual source of the trouble. Suppose it had turned out that the infection was milk-borne, and Dr. Holden had from the first concentrated his attention on the water, would he not have been subject to criticism? In fact, five out of the first six cases were on the same milk supply, and, with the Bournemouth epidemic in mind, Dr. Holden was keeping in view the possibility of milk among other causes. But he never neglected the water. It had been stated in evidence that at a meeting of residents, in reply to a question, he said it was "inconceivable" that the water could be to blame, but it was evident that all the people concerned were thinking at that time, not of the general water supply, but of some local contamination affecting the main in the streets where the first cases arose. Even before that meeting took place Dr. Holden, so far from neglecting water, had given instructions for samples to be taken from taps in the houses where cases had occurred and for the mains to be tested.

On the question of want of co-ordination, the fact that no medical committee was in existence might be a matter for recommendation by the tribunal. But it was not a matter on which the medical officer could be expected to take the initiative during an epidemic. It was not Dr. Holden's fault that the committee was not constituted; it was for the other doctors to constitute the committee and proffer their help. He was not concerned with the suggestion that there should be an obligation on all local authorities to set up committees of medical men, but Dr. Holden had said that he would be glad to have co-operated had such a committee existed. Neither the Panel Committee nor the British Medical Association represented the whole of the medical profession, and, moreover, as Sir William Willcox himself had said, the thing could not be done in the midst of an outbreak; it must be prepared beforehand. But he was anxious that the tribunal should not have the impression that the Corporation or Dr. Holden was antagonistic to the idea.

In conclusion Mr. Sandlands hoped the tribunal would not forget the hundreds of things that Dr. Holden had had

to do and of which no mention was made. Every doctor who wanted help could obtain it from the office of the medical officer. At the invitation of the doctors of Croydon Dr. Holden or his deputy had paid no fewer than fifty visits to patients in their homes. He mentioned that as showing that cordial co-operation did exist between the individual medical men who wanted help and the medical officer whose duty it was to supply it. In addition there were multitudinous arrangements to be made—samples to be taken, laundry supervision to be instituted, a great increase of hospital accommodation and nursing staff to be provided. All these were matters which should be considered in judging the work and the responsibility of the medical officer during the strenuous and anxious period.

The closing speeches of the Inquiry were made by Mr. Lyons, K.C., on behalf of the South Croydon Typhoid Committee, and Sir Walter Monckton, K.C., on behalf of Croydon Corporation.

On the last day of the hearing (January 11) it was announced that the total cases numbered 290, no fresh cases having been notified for several days. The number of deaths was 38. A bulletin outside the town hall stated that six patients were still dangerously ill with typhoid at Mayday Hospital, and seven others seriously ill.

EDUCATION AND HEALTH

CONFERENCES OF TEACHERS' ORGANIZATIONS

Over fifty educational associations combined for a five-day conference during the first week of the New Year at University College, London. As many as six meetings were sometimes taking place simultaneously, and the crowded theatres and corridors bore witness to the enthusiasm of the teaching profession. Several of the sessions were occupied, directly or indirectly, with the subject of health in the schools, and the Government's physical fitness campaign was often referred to, and at times critically examined.

The Minister of Health (Sir KINGSLEY WOOD) was president of the conference, and in an inaugural address on the subject of "Education and Health" ranged over the activities of his department. He mentioned that the new midwifery service would be seen in almost full operation throughout the country during the present year. Already some 7,000 midwives had been appointed. Lord DAWSON OF PENN, who proposed a vote of thanks to the Minister, said that an improvement in the maternal mortality figures might be hoped for in the near future, but it could not be repeated too often that in the earnest advocacy of the importance of reducing maternal mortality care must be taken not to frighten those young people who had maternity in front of them. Lord Dawson said that members of the medical profession were thinking more than ever in terms of education, and it was important that all those posts which were concerned both with education and health should be open to all medical men and women.

Health in the Schools

Sir FARQUHAR BUZZARD presided over a joint conference of all the organizations on the subject of "Health in the Schools." He stressed the importance of games, recreation, rest, diet, and fresh air, as well as the mere physical exercises, in the national campaign which had for its object a higher standard of physical fitness. The conference was addressed by Mr. M. L. JACKS, head master of Mill Hill and director-elect of the Department of Education, Oxford University. He dealt with certain forms of "sickness" which were specially the concern of the teacher, such as lack of power to develop skill, lack of knowledge of muscular potentiality and economy, and inability to sit, stand, or move with grace and ease. The first necessity was to create in every public school a department of physical education, on a level with other departments such as modern languages, and with a university graduate to direct it. The interest of the director should be in the individual, particularly the weakling, rather than in the class. Mr. Jacks said that in his own experience he had discovered that whereas at about the age of 16 a boy normally put on about two pounds in weight every term, in the term in which he took the school certificate, generally at the age of 16½, there was a tendency to stand still or to lose weight. This indicated one of the strains and stresses which the director of physical education would have to bear in mind.

Criticism of the physical fitness campaign came from the high mistress of a girls' school, Miss ETHEL STRUDWICK of St. Paul's, Hammersmith. The word "fitness" was too closely associated with advertisement. She had never found it easy to believe that medicines or anything else which were widely advertised on the hoardings really did anybody any good. She distrusted the advertisement part of the campaign because she feared it might mean an artificial boom followed inevitably by a slump. Nor did she like the idea of middle-aged women being encouraged to emulate the poster-girl and poise on one toe!

Medical Aspects of Backwardness

In his address to the Medical Officers of Schools Association Dr. R. G. Gordon said that backward children might be divided into three classes—those who were born stupid, those who acquired stupidity, and those who had stupidity thrust upon them by bad upbringing. In the first class might be included children with certain inborn defects of vision, hearing, and other senses, which made for backwardness, also children physically enfeebled because coming from poor or degenerate stock. As for those who acquired stupidity, he thought that while malnutrition might for the time being depress intelligence, it did not seem to be a cause of backwardness in itself. General diseases likewise did not seem to have a very pronounced influence in this respect except in so far as they led to absence from school. The effect of diseases of the central nervous system was an important and interesting subject. The most obvious of these was epidemic encephalitis, and the effects of this disease largely determined a modification of the definition of mental deficiency in the new Act. He believed this condition demonstrated in an exaggerated form the process which was seen in a much more common condition—namely, chorea. Choreic children, who were often, of course, rheumatic children, were of the highly strung rather than the bright, intelligent type; but it had been well said that the choreic child was jerky in mind just as he was jerky in body, and so he was erratic, inattentive, and lacking in concentration. Enlarged tonsils and adenoids were often blamed for backwardness, but he was rather a sceptic about the wholesale blessings which followed operation for their removal as a mass production performance. Dr. Gordon also dealt with endocrine abnormalities and emotional disturbances in the same connexion. As for the third class of children, those who had stupidity thrust upon them, this was a group with which, as practitioners, they had comparatively little to do, since in this category were included those who had been badly taught and thus deprived of the grounding which was so essential to future progress. Yet although it was not the business of the doctor to criticize the teacher, he ought to keep in mind that the backwardness upon which he was called on to advise might be due to factors not really within his province at all.

Health and Retardation

The question of the backward child figured in several other discussions during the conference. Dr. MILDRED

CREAK, psychiatrist at the Maudsley Hospital, discoursed to the Child Guidance Council on the children who fail to learn. Even the Mathematical Association discussed the teaching of the complete duffer, and seemed to agree that mathematics was the first thing to suffer when a child was undergoing emotional conflict. The trouble was, as Dr. F. H. DODD pointed out to the mathematicians, that such a child retreated into a world of fantasy, and the world of reality—which is a mathematical world—became remote.

Dr. CHODAK GREGORY addressed the Child Study Society on "Health and Retardation." In particular she spoke of the neglect of children during the second and third year of life—a period of great morbidity if not of mortality. Advice on behalf of the toddler was comparatively rarely sought, and it appeared to be the idea of many parents that, having weathered the stress of infancy, he could be awarded a little wholesome neglect. Dr. Gregory also said how strongly she had been impressed by the incidence of rickets in young children. She had been asked to judge a baby show in a village, and was horrified to find that when the thirteen babies presented were undressed all but one of them showed some signs of rickets. This was in a village where there was no unemployment and where every cottage had its garden, though it appeared to be the parents' habit to keep their children in the stuffy rooms.

Dr. J. A. HADFIELD, who presided on this occasion, said that in his opinion, in respect of the recognition of mental deficiency at an early stage, council schools were more fortunately placed than private. He had had not infrequently children sent to him with quite aggravated mental deficiency by parents who refused to admit that their children were mentally deficient at all. Often backwardness was due to emotional causes. A child whose whole mind was occupied with fear and anxiety could not be expected to devote himself to scholastic work. Sometimes the fear arose out of a hypersensitive conscience, and in such cases might be traced back to an illness in early childhood. The fact that the child had got over pneumonia, rickets, or some other malady did not mean that everything was well. These conditions often left behind them abnormalities which manifested themselves later in the form of morbid fears.

Many Voices

The spiritual aspect of health, dealt with by Dr. BURNETT RAE before the Institute of Christian Education, attracted one of the largest of the sectional audiences. Fatigue problems in the preparatory school child was the subject of an address by Dr. ANNIS GILLIE to the Association of Head Mistresses, and Dr. BRADFORD HILL of the London School of Hygiene and Tropical Medicine addressed the Association of Teachers of Domestic Subjects on national nutrition. Physical training in the Army was described by Major T. F. KENNEDY to the British Association for Physical Training. The Army system, he said, was a combination of the Swedish and Danish systems, and aimed at producing a harmonious development of body and mind through the medium of progressive muscular education. The Ling Physical Education Association was addressed by Mr. KENNETH LINDSAY, M.P., Parliamentary Secretary to the Board of Education, on the subject of national fitness, and this body had a number of other speakers, including Mr. W. P. ALEXANDER, director of education for Margate, who criticized the three-year course for physical education instructors on the ground of the insufficiency of time devoted to psychology.

The University of London Animal Welfare Society arranged a lecture by Dr. R. LOVELL of the Royal Veterinary College on diseases common to man and animals. After reviewing the various bacillary and protozoal diseases he showed how a disease in one species might develop in a different way from the same disease in another. A familiar example was the disease due to *Brucella abortus* as manifested in man and in cattle. Finally a session was devoted to the health of the teacher's voice, which was considered in relation to the health of the individual as a whole. Dr. PHILIP KEMP, school medical officer, Birmingham, said that while the evils of noise had been faced and to some extent remedied, little had been done to exploit the therapeutic value of pleasant sounds. He foresaw a time when appropriate music might figure in medical prescriptions, especially in nervous disorders.

INTERNATIONAL ORGANIZATION AGAINST TRACHOMA

MEETING IN CAIRO

A meeting of the Executive Committee of the International Organization against Trachoma was held on December 9, 1937, at the Semiramis Hotel, Cairo. The secretary-general read the minutes of the previous meeting, held in Paris in 1936, and the accounts were then passed. The subvention given for purposes of research by the American Academy of Ophthalmology and Oto-laryngology—100 dollars—was allocated to Dr. Poleff of the Pasteur Institute at Rabat, Morocco. It was decided to hold the next meeting of the organization at the same place and at the same time as that of the International Council of Ophthalmology, in 1939.

Assembly of Delegates

On the following day an assembly of delegates was held. After a statement by the president on the business to be transacted, the audited accounts were passed, and Professor Manuel Marquez was elected an honorary member of the Executive Committee. The president, Mr. A. F. MacCallan, and the secretary-general, Dr. Wibaut, who were elected for a period of five years at the meeting in London in 1935, remain in office. According to the statutes four members of the Executive Committee were then due to retire, but as all members had to retire in 1937 it was decided to defer elections until the present meeting.

The president explained that six nations were already represented on the Executive Committee, as follows: Great Britain (Mr. MacCallan, president), Holland (Dr. Wibaut, secretary-general). France (Dr. Bailliart) and the United States (Dr. Park Lewis); representing the International Association for the Prevention of Blindness. Hungary (Professor de Grosz) and Spain (Professor Marquez); honorary members. For the twelve vacancies it was decided that twelve nations other than those previously mentioned should be represented, and that each national representative should be selected by the national group; also that, as provided in the statutes, no distinction should be made as to grades of vice-presidents, members, and secretary. It was then resolved that the following nations, as being those most subject to trachoma, should be represented on the Executive Committee: Argentina, Bulgaria, Czechoslovakia, Egypt, Germany, India, Italy, Japan, Lithuania, Poland, Rumania, and Turkey. Subsequently it was announced that the national groups had chosen the following as their representatives: Argentina, Dr. José A. Sena; Bulgaria, Professor Pascheff; Czechoslovakia, Professor Kadlicky; Egypt, Dr. Tewfik; Germany, Professor Rohrschneider; Italy, Professor Leonardi; India, Dr. Mukerjee; Japan, Professor Oguchi; Lithuania, Dr. Avizonis; Poland, Dr. Zachert; Rumania, Professor Michail; Turkey, Dr. Naci Bengisu.

The Scientific Meeting

On December 10, 1937, the scientific meeting was held, also at the Semiramis Hotel. After an introductory address by the president, interesting discussions were held on "The Microbiological Aetiology of Trachoma," on "The Pathology of Trachoma," opened by Dr. Rowland P. Wilson, and on "The Treatment of Trachoma." These were followed by papers by Professor Motegi, Dr. Lijo-Pavia, Dr. Zachert, Dr. Sarnelli, Dr. Jacovides, Dr. Hassouna, and Dr. Charamis.

Reports of Societies

CARDIAC COMPLICATIONS IN MAJOR ABDOMINAL SURGERY

At a meeting of the Section of Surgery of the Royal Society of Medicine on January 5, Professor G. GREY TURNER presiding, the question of cardiac complications in major abdominal surgery was discussed.

Dr. PAUL WOOD said that the cardiac complications of major abdominal surgery were "over-diagnosed" by many surgeons. Hearts with disease stood up to the strain of abdominal operations surprisingly well. During the post-operative period certain symptoms suggested heart trouble. He proceeded to attempt a classification of cardiac and non-cardiac complications based on these presenting symptoms. Pain in the chest might be due to myocardial infarction, to pulmonary embolism, or to pericarditis; more often it was non-cardiac. He laid stress upon the various manifestations of pulmonary embolism, and particularly upon the cases without pain or haemoptysis. Dyspnoea might be caused by congestive heart failure or by pulmonary embolism, but was usually non-cardiac, and might be due to pulmonary complications, to abdominal distension, to subphrenic inflammatory conditions, or to uraemia. He emphasized the rarity of congestive heart failure as a post-operative complication. Sudden collapse might be due to myocardial infarction or to pulmonary embolism. A slower type of collapse was usually due to dehydration, haemorrhage, peritonitis, or to other surgical complications. Peripheral circulatory failure was far more frequent than cardiac failure. A rising pulse rate and a falling blood pressure were important signs of impending collapse, and sufficient fluids must be given rectally or intravenously—about 7 litres in twenty-four hours; a urinary output of some 1,500 c.cm. daily should be maintained. Irregularities of rhythm were commonly due to ectopic beats, and pointed more to infection or to abdominal distension than to heart disease. Patients who developed auricular fibrillation should be thoroughly overhauled by a physician.

He summed up his argument by saying that the most dramatic occurrences were usually due to pulmonary embolism, but might be the result of myocardial infarction. Dyspnoea found alone was nearly always of a pulmonary nature, and might derive from bronchopneumonia or some like condition. Congestive heart failure was a rare event, and did not occur unless the heart was very badly diseased. When faced with obscure post-operative disease the surgeon would do well to consider carefully all possible surgical causes and complications before he accused the heart. In the absence of a necropsy it was often very difficult to convince the surgeon of the heart's innocence.

Cholecystitis and Heart Disease

Mr. D. H. PATEY remarked that it was interesting to hear the cardiologist emphasize the rarity of heart failure as a cause of death after operation; this point had been stressed so much from the anaesthetist's side. He raised a question on the apparent association of the gall-bladder with cardiac pain. Was there some relation between the gall-bladder and myocardial infarction, or was it that cardiac pain was simulated by the gall-bladder? Mr. H. W. RODGERS asked whether the fear of impending death had been found to have any relation to the presence of a cardiac lesion; also whether the use of digitalis was at all justifiable in cases in which there was no auricular fibrillation. Mr. HOPE CARLTON referred to the amount of fluid which Dr. Wood had recommended in cases of impending collapse. It seemed to him that 7 litres in twenty-four hours, given rectally or intravenously, was enormous. Ten years ago intravenous therapy was pressed upon them strongly, but more recently it had been somewhat discounted. Professor GREY TURNER was glad to find Dr. Wood insisting on the risks that could be taken surgically in cases of heart disease. Nothing had impressed him more than the way in which patients with heart disease would tolerate the necessary operation.

Dr. WOOD, in reply, said that cholecystitis was sometimes diagnosed as angina and angina as cholecystitis. In patients with angina and cholecystitis or gall-stones, if the gall-bladder were removed there was a temporary improvement in the angina. Any failing heart would benefit from digitalis, but if administered it should be by a physician. With regard to fluid, it had been shown quite conclusively that patients needed 6 pints of fluid a day. About half of this amount they received in the form of solid diet; but the patients in these cases were not receiving solid diet, and therefore required the same amount of fluid in another form. In addition, they might have been vomiting a great deal, certainly they had been sweating, and probably over-breathing under the anaesthetic, so that they were in a dehydrated state. He granted that if 7 litres were given in twenty-four hours most of it should be given rectally. Far more fluid could be given successfully by the rectal route than was generally recognized.

The Circulation in Gangrene

Mr. JAMES F. PHILIP gave a demonstration by means of lantern slides of the circulation in gangrene of the lower extremities as seen radiographically after injecting the arterial tree. He discussed the different forms of gangrene seen in diabetes, arteriosclerosis, and thrombo-angiitis obliterans. He believed that no single mode of treatment could be universally successful, and that sympathectomy, physiotherapy, and amputation each had its place in the treatment of this disease. As regards the venous system, in arteriosclerosis the veins were seldom occluded; in diabetes, thrombosis of the veins was a frequent occurrence; and in thrombo-angiitis obliterans the veins appeared to be affected just as much as the arteries. After some questions and brief discussion Professor GREY TURNER said that he could not help thinking that there was yet a good deal of work to be done on revascularization in such cases. It must be assumed that something of this kind might occur in certain cases of gangrene spontaneously. He recalled patients in years gone by who had refused to have surgical intervention in gangrene, and who had recovered. In diabetic gangrene he had been impressed on occasion by the extreme virulence of the infective type. This was not nowadays so often noticed, because the metabolic condition was brought under treatment at an earlier stage.

Mr. PHILIP, in reply, described attempts at revascularization by means of physiotherapy, which, he said, gave good results. He instanced the case of a gamekeeper, aged 60, who could walk only 200 yards before developing claudication. Pulsation was absent from the major arteries of both legs. He was put on various exercises, contrast baths—that is, alternating hot and cold—and diet, with rest and the wearing of warm socks, and afterwards reported at three-monthly intervals. He had now been back at work for three years, though there was some slight recrudescence of the trouble each winter. Even in gangrene due to diabetes these attempts at revascularization of the limb had been at times of assistance.

A meeting of the Section of Medicine of the Royal Academy of Medicine in Ireland was held on December 10, 1937, with the president, Dr. E. T. FREEMAN, in the chair. Dr. H. L. PARKER reported a case of the Laurence-Moon-Biedl syndrome, and Dr. ALAN THOMPSON a case of chloroma. Dr. P. T. O'FARRELL read a paper on a series of cases of both acute and chronic types of peripheral arterial occlusion of organic origin. Each communication provoked a lively discussion in which, among others, Dr. A. R. PARSONS (President of the Academy), Dr. EUPHAN MAXWELL, Dr. E. HARVEY, Dr. G. C. DOCKERAY, Dr. J. C. FLOOD, Dr. H. B. GOULDING, Dr. BOUCHIER HAYES, Dr. J. LEWIS, and Dr. JESSOP took part.

Local News

SCOTLAND

Glasgow Royal Infirmary

The annual nurses prize-giving and tour of the wards of the Royal Infirmary, Glasgow, was made on January 1 by Lord Provost Sir John Stewart and the governors of the institution. Sir John Stewart said that the voluntary hospitals seemed to have increasing difficulties with finance. He had often wondered why the Royal Infirmary had not started wards for paying patients. These had been successful in another hospital in Glasgow, and in the case of the Royal Infirmary would, he thought, help to ease the financial situation. Sir James Macfarlane, chairman of the Governors, said that their expenditure was steadily increasing, and during the past year had gone up by £10,000. Legacies, on the other hand, had dropped by £10,000. Provision had been made for paying patients in an auxiliary hospital of the Royal Infirmary at Canniesburn, which would be opened by Sir Iain Colquhoun on January 18. The number of patients admitted to the Infirmary during the past year had been 18,171—529 more than in the previous year—and the number of out-patients had been 113,003. During the year the hospital had obtained possession of the neighbouring premises previously occupied by the Royal Asylum for the Blind. Part of that building was being altered and would be used to accommodate the outdoor department and make provision for various specialties, including *x*-ray diagnostic work, medical electricity, and massage.

Maternity Work in Glasgow

The medical report for 1936 of the Glasgow Royal Maternity and Women's Hospital illustrates the working of the "permanent unit system." Of the 175 beds in this maternity hospital seventy-eight are reserved for ante-natal cases and another seventy-eight for lying-in cases, while nineteen beds in a special isolation block are set aside for suspect cases. Septic cases are transferred to the city fever hospitals. During the year under review 4,717 patients were admitted, the average daily number of patients in the wards being 166; the number of children born in the hospital was 3,389. There were sixty-six maternal deaths, the death rate being 1.4 per cent. Joint action with the Glasgow Corporation enabled the hospital to continue its policy of not refusing treatment to any woman in labour and at the same time not further overcrowding the wards. In 1936 the municipal hospitals accepted 651 patients as overflow cases. The ante-natal department is growing in importance; from the ante-natal dispensary on the hospital premises many cases were admitted to the obstetrical department and the ante-natal wards. During the year 4,724 women were attended in their homes by the hospital staff and 4,543 infants were delivered. The number of abnormal cases was 3,346 (70.9 per cent. of all admissions), many being emergencies, a fact which, coupled with the high incidence of rickets in the population served by the hospital, indicates the gravity of some of the cases and has a bearing on the morbidity and mortality rates. Twenty-one patients (31.8 per cent. of the total number of maternal deaths) died within twenty-four hours of admission, and a further twenty-one, who survived that period, died within seven days of admission. Of the total 4,717 cases treated in the hospital wards, 1,864 (39.5 per cent.) had received ante-natal supervision in the hospital clinic. The medical staff is conducting research into infections of the urinary tract, puerperal fever, the toxaemias of pregnancy, and the endocrine glands. This annual report, which has been as ably prepared by the registrar, Dr. R. Murdoch, as its predecessors, contains much information of clinical interest, including a classification of maternal deaths on a pathological basis, with a detailed summary of each of these cases.

Finance of the Edinburgh Royal Infirmary

At the annual meeting of the Court of Contributors to the Royal Infirmary, Edinburgh, Sir Thomas B. Whitson, chairman of the Board of Managers, referred to a deficit of over £40,000 on the ordinary account for last year's working. There had also been an extraordinary expenditure with additions and improvements to buildings of £15,000, and a sum of £62,000 had to be met from legacies and special donations. The Managers pleaded most earnestly for increased and additional contributions, especially in view of the future, when, with a much larger institution, more expenditure would be incurred. The ordinary expenditure for the year had been £177,044. The average annual cost per occupied bed had been £177, and the average daily cost per patient 9s. 9¼d. The speaker suggested that many people might be able to send a ten-shilling note, which would pay for one patient for one day. The appeal for the extension fund, he continued, was not making headway as quickly as they would like. Of the £200,000 appealed for only £80,000 had so far been raised, leaving £120,000 still to be collected. The most strenuous efforts would be required to get that sum.

It was agreed at the meeting to remit the annual report to a special committee for consideration. The report states that one satisfactory feature of the accounts was that the increase in ordinary expenditure had been covered by a corresponding increase in ordinary income, but the Managers could not but feel anxious as to the financial position in view of greater commitments in the future. When it was considered that patients were not asked to contribute, nor was there any inquiry as to their means, the amount received as contributions from patients, £5,407, was not unsatisfactory, but a further increase from this source would be welcomed. There had been a progressive falling off in the payments made by approved societies as additional benefits during the last few years. It was fortunate, however, that the receipts from legacies had been highly satisfactory, amounting to £95,142, of which £14,388 had been bequeathed for endowment purposes. Prices of commodities, as well as the number of patients treated, had risen, and the cost of maintaining the radiological department had reached a figure of £15,000 per annum. New methods of treatment, improved apparatus, and increased arrangements for the care and comfort of patients all created additional expense. The National Radium Commission had allocated to the Infirmary, as the National Radium Centre for South-East Scotland, a further supply in order that the mass unit might be increased to three grammes. The enlarged "bomb" had been erected at Beechmount Annex, and would very shortly be in operation.

Edinburgh Dental Hospital and School

An appeal has been issued by the Edinburgh Dental Hospital and School for £55,000 to meet the growth in the number of patients and the need for more modern accommodation and equipment for teaching and treatment. Lord Provost Gumley, in a broadcast speech on January 2, said that this was the largest dental school in Scotland, and, in the United Kingdom, was second only to the dental school of Guy's Hospital. Patients attending in 1936 numbered 29,369, and in 1937 that number had risen. There had also been an increase in the number of students; in 1934 there were 187, and in 1937 there were 274. It was now proposed to demolish the old parts of the hospital behind the present modern frontage. These had originally been private houses, and their place would be taken by a building provided with what was practically an all-glass back. The natural lighting would thus be efficient for day work, and for night work special electric lighting would be available. The history of this hospital was interesting. Dr. John Smith had been the first man in Edinburgh in

the middle of the nineteenth century to realize the importance of training in dentistry, and in 1856 he had begun a course of lectures on physiology and diseases of the teeth. Working with others he had opened an Edinburgh Dental Dispensary in Drummond Street in January, 1860. After various transfers the dispensary had come to occupy the present site in 1878, and had changed its name to the Edinburgh Dental Hospital and School. In 1914 the site and premises had been purchased, but the plans for extension had to be postponed till after the war. There had been alterations in 1927, but there was now urgent need for further extension. So far £11,000 has been subscribed in response to the appeal.

ENGLAND AND WALES

Prevention of Blindness

The London County Council is proposing to ask the Medical Research Council to take steps to investigate the question of the influence of myopia in causing blindness and the part played by the special schools for the partially sighted in such prevention. The Hospitals and Medical Services and Education Committees of the County Council have jointly considered the matter, and are of opinion that in order to obtain some satisfactory knowledge of the problems of myopia an investigation is urgently necessary. Such an investigation should be a comprehensive one and could not be adequately undertaken by a local authority. Assistance could be rendered to the Medical Research Council by placing county council records at its disposal and giving facilities for research work to be carried on in its educational institutions. The matter has arisen immediately out of the recent report of the standing committee of the Union of Counties Association for the Blind, a voluntary body working in close association with the Ministry of Health, the Board of Education, and various agencies chiefly concerned with prevention. This committee, in its report, points out that the treatment of visual defects of children attending special schools was dealt with in the report of the Committee on Partially Sighted Children in 1934. In that report no definite conclusion was reached beyond emphasizing the need for further research. The standing committee is in agreement with the conclusion that the influence of myopia in causing blindness, and the part played by the special school in preventing it, is the most important of all problems with regard to myopia which needs further consideration.

St. Mary's Hospitals, Manchester

The report for 1936 of the maternity department of St. Mary's Hospitals, which has been prepared by Dr. R. Newton, reveals that 931 maternity patients were treated in their own homes and 2,545 in the hospital, no fewer than 1,282 being emergency cases. It is interesting to note that of the 1,263 booked cases 1,040 were delivered at or near term, 215 were discharged undelivered, and there were eight abortions, whereas among the emergency cases admitted to the hospital only 627 were delivered at or near term, 335 were discharged undelivered, and there were no fewer than 239 abortions and nine ectopic pregnancies. There were altogether thirty-three maternal deaths, representing a mortality of 1.31 per cent. of the total in-patients, the mortality in booked cases being 0.63 per cent. as compared with 1.99 per cent. in emergency cases. Cases of contracted pelvis numbered 185, in fifty-three of which delivery was by natural forces; Caesarean section was undertaken in fifty-nine cases and induction of labour in fifty-three. The remaining cases were treated by forceps or by version and extraction. There were nine cases of tubal pregnancy, in seven of which rupture had occurred, and one of these patients died. Rupture of the uterus was also responsible for one death in five patients, and among the twenty cases of eclampsia treated during the year there were four deaths.

Correspondence

Use and Abuse of Antiseptics

SIR,—It is to be hoped that the article on this subject by Professor L. P. Garrod and Mr. G. L. Keynes which appeared in your issues of December 18 and December 25, 1937, has been widely read and will have the influence it deserves. I have on several occasions in the past tried to point out some of the defects of common surgical practice in regard to the use of antiseptics, and I am glad to see that the present authors are in almost complete agreement with me.

Greater emphasis might perhaps have been laid on the selective action of some chemical antiseptics. The older ones, such as carbolic acid or the hypochlorites, are more or less equally active on all pathogenic bacteria. Some of those introduced more recently, however, are highly selective, and inhibit the growth of one microbe in very high dilutions while having little effect on another (which may be closely related to the first) in ten, twenty, or more times that concentration. It seems to be the fate of all chemicals that if they are shown to have a beneficial effect on infections by one bacterium they are used in all sorts of other infections, despite definite laboratory evidence that there is no chance of their exercising any influence on the growth of the infective agent.

Wisely, the authors have treated separately the problem of the recently inflicted wound and that of the wound in which the infection has become established. In the recently inflicted wound the bacteria have not grown out but are simply lying at the point at which they were introduced, nor have the tissues begun to react to the infection. Theoretically it should in many cases be possible to reach the bacteria with an antiseptic, but practically in all but clean-cut wounds it has been shown that efficient surgical technique is more effective than chemicals. The body, if given a chance, can deal with considerable numbers of the bacteria which commonly infect wounds, and it is the function of the surgeon to give the body a fair chance. In most cases it is only the less skilful surgeon who would pin his faith on the local application of a chemical. In an established infection the bacteria have grown into the tissues and are out of reach of an antiseptic applied to the surface. At the same time the tissues around have reacted to the infection and are crammed with phagocytes whose function is to ingest and destroy the bacteria.

The injunction of Garrod and Keynes that "strong applications to the wound itself are to be avoided" seems to sum up a reasonable teaching in regard to the use of antiseptics in such wounds. They mention that some antiseptics may give benefit by a mild irritation which stimulates the flow of fluid from the infected walls into the cavity of the wound. This drainage of the infected tissues is as important as the drainage of the cavity of a wound. The defence against a septic infection is mainly phagocytic, but before the bacteria can be picked up by the phagocytes they must be acted on by the opsonic substances in the body fluid. These opsonic substances become used up in the stagnant fluids in the wall of an infected wound, and unless such fluids are drained off and replaced by fresh fluid from the vessels it is clear that the phagocytes are at a disadvantage. The importance of draining the infected tissues is not as well appreciated as it ought to be. However, this is not direct antiseptic action, and if we are to apply the name "antiseptic" to substances which stimulate the outflow

of fluid from the infected walls of a wound, then common salt would have to be classed as a potent antiseptic, for this increased outflow is the basis of the hypertonic salt treatment which has been shown to be of great value in the treatment of septic wounds. Garrod and Keynes confirm my finding that Dakin's fluid has this power of stimulating the outflow of fluid from the walls of a wound. They mention continuous irrigation with this fluid, but this procedure does not seem to be necessary; better results were, I believe, achieved by the intermittent irrigation introduced by Carrel when Dakin's fluid was instilled into the wound every two hours. I have shown that within ten minutes of placing Dakin's fluid in a wound it ceases to be antiseptic in a serous medium. In Carrel's method, therefore, the antiseptic functions as an antiseptic for less than ten minutes, but the increased exudation from the walls of the wound persists, so that for something like one hour and fifty minutes out of every two hours there is an increased tissue drainage which favours phagocytosis but no chemical antiseptic that might hinder this defensive mechanism. This treatment was, I think, regarded as the most successful "antiseptic" treatment evolved during the great war.

I should like to make some reference to the action of acriflavine. Garrod and Keynes mention that leucocytes retain motility in a 1 in 1,000 solution. This is true, but in this matter the time factor is all-important. Acriflavine is a slow-acting antiseptic, and its full effect on bacteria is only seen after they have been exposed to the action of the chemical for some hours. Exactly the same thing happens with leucocytes; if only fifteen minutes' exposure is given they retain their phagocytic power in a concentration of 1 in 1,000. If the exposure is five hours their phagocytic activity is seriously impaired by a dilution of 1 in 500,000, and if they are exposed to acriflavine for twenty-four hours they are destroyed by 1 in 2 million—a dilution which has no action on the growth of bacteria.

The best simple test of the probable value of a chemical as an agent for killing bacteria in the body is a comparison of its power of inhibiting the growth of bacteria and of destroying leucocytic function. Such a test will show that all the commonly used antiseptics are more powerful inhibitors of leucocytes than they are of bacteria, indicating that there is little likelihood that by their continuous application any direct beneficial antibacterial effect will ensue. Some of the arsenic preparations, such as novarsenobillon, act on haemolytic streptococci in about the same dilutions as those in which they affect leucocytes, and sulphanilamide only inhibits leucocytes in a dilution of about 1 in 400, while it inhibits haemolytic streptococci in blood in a dilution of about 1 in 400,000. Sulphanilamide and the allied chemicals are the only chemotherapeutic agents which have a much greater action on bacteria than they have on leucocytes, and they are the only chemotherapeutic agents which have been used with striking success for the destruction of the ordinary pyogenic bacteria in the human body.

In conclusion, while congratulating Professor Garrod and Mr. Keynes on their article, I would like to say that my remarks are not in criticism but in amplification of their all-too-short paper.—I am, etc.,

Inoculation Department, St. Mary's Hospital, Jan. 5. ALEXANDER FLEMING.

SIR,—The object of this letter is to repair what I think is an important omission in the interesting paper on antiseptics by Professor L. P. Garrod and Mr. Geoffrey L. Keynes. Briefly stated, their paper deals with antiseptics applied as lotions. Areas in which suppuration is kept up by the irritation of infected discharge are frequently treated by these. Any penetration of the antiseptic which takes place depends on diffusion, and unless the conditions are favourable penetration is slow and, moreover, is not easily controlled. The writers point out that the strength of solutions must be moderate to avoid causing irritation or destruction of tissues. The omission is that no mention is made of the electric current for introducing a particular component of a salt in solution which is a recognized antiseptic, such as zinc sulphate. The component in it on which the antiseptic action depends is the zinc ion. The solution can be used so weak (0.25 per cent.) that penetration due to diffusion need not be considered. The penetration and its extent depend on the strength of the electric current and on the time this is applied. When introduced the zinc combines with the albumin present in the film of infected discharge adhering to the surface and in the superficial tissue cells to form zinc albuminate—an insoluble precipitate. This is a bad culture medium for micro-organisms, which therefore die, irritation vanishing and suppuration ceasing. One treatment when the suppurating area is accessible is usually sufficient. The authors do not state how often the antiseptics they mention should be applied, or for how long. This may be due to lack of sufficient convenient clinical material to carry out tests. There exist numerous cases of chronic otorrhoea due to sepsis alone in an accessible position—the tympanic cavity—and the result of treatment by antiseptic solutions would show their relative value and the best method of applying them.—I am, etc.,

Sidmouth, Jan. 3. A. R. FRIEL.

Prevention of Puerperal Fever

SIR,—May I be allowed to correct a false impression which Professor Miles H. Phillips has conveyed—unwittingly, I think—in his valuable historical review of steps in the prevention of puerperal fever, published in the *Journal* of January 1 (p. 1). He speaks of "special recognition" being given to my work in that field. I want to make it clear that the work done in this laboratory has been essentially team work by all the members of the laboratory staff, and that my own has not been the most important contribution to it. The results of our work may be briefly summarized as follows. First, we were able to confirm the fact, so ably brought out by Schottmuller twenty years ago, that anaerobic streptococci play an important, although not the most important, part in puerperal infections. Secondly, in collaboration with Mrs. Lancefield at the Rockefeller Institute, we were able to show that the great majority of the most severe puerperal infections are caused by one class of haemolytic streptococci, now commonly known as group A, in distinction to the several other groups, and that this, the most dangerous streptococcus, is probably always introduced into the genital tract from some outside source. Finally, it was shown that the haemolytic streptococci causing these severe puerperal infections were in most cases identical with those present in the respiratory tract of some person with whom the mother was in contact either before, during, or after her confinement. This finding leaves little room for doubt that these streptococci are usually conveyed to the mother from such an extragenital source.

For this last accomplishment, perhaps the most important landmark in the history of the prevention of puerperal

fever, the chief credit undoubtedly belongs to my sister, Dora Colebrook—with the reservation that her investigation was made possible by the earlier pioneer work on agglutination reactions of haemolytic streptococci by Dochez, Avery, and Lancefield (1919), F. Griffith (1926 and 1935), and others. For the demonstration of the paramount importance of the group A streptococci in connexion with puerperal fever the chief credit belongs to my former colleague Dr. Ronald Hare, here again with due acknowledgment of the earlier work on the differentiation of the haemolytic streptococci into groups by Mrs. Lancefield.—I am, etc.,

Bernhard Baron Memorial Research Laboratories, Queen Charlotte's Maternity Hospital, Jan. 6. LEONARD COLEBROOK.

Insulin for Local Sepsis

SIR,—Mr. Nevil Leyton has just recorded (*British Medical Journal*, January 8, p. 70) his great success in healing chronic local sepsis by dressings of ordinary insulin solutions. This is no new story, and similar enthusiasm was recorded in France about 1926 in the treatment of chronic ulcers (I regret that, being in the country, I cannot now give the exact reference). Later it was shown that a dressing of similar acidity and antisepticity without insulin had the same effect as actual insulin solution. And so the enthusiasm waned to revive again now.

From the nature and physiological action of insulin it is highly improbable that it can have any local action on a raw area. Insulin dressings, particularly of "double-strength" insulin which Mr. Leyton has used, must be very expensive, and before the method is advocated for widespread use more controlled and convincing experiences must be available. I would suggest that half the wound be dressed with active insulin solution, the other half with heated—and so inactivated—insulin solution. If any difference in healing is observed the expense might be proved worth while.—I am, etc.,

London, W.1, Jan. 10. R. D. LAWRENCE.

Names for New Drugs

SIR,—During the past two years three groups of drugs, which may fairly be said to have revolutionized treatment in their respective spheres, have been widely introduced into medicine. It seems to me regrettable that while some of them have become the subject of a terminological haze, others are not yet easily available. The value of the sulphonamide or "prontosil" group must surely have been appreciated in view of its constant mention in recent literature, but it is still only possible to prescribe drugs of this group under a simple and easily remembered name by having recourse to proprietary preparations. It must be the experience of many panel practitioners that the price of these preparations varies greatly, and in the event of his prescribing honestly for his patient, and at the same time reducing the cost of his prescription to a minimum, he is always liable to end up with a headache. Since in the long run the true value of any drug rests in its successful use in the treatment of disease, and as the greatest incidence of disease in this country falls among the insured classes, the subject would seem not unworthy of a Royal Commission.

In my experience it may be fairly stated that the treatment of *B. coli* urinary infections has been revolutionized by the use of the mandelic acid derivatives. The period of illness and probably the liability to residual infection have been greatly diminished by these drugs. Is it any longer fair to the insured classes to prolong treatment by using the less effective but inexpensive alkalis and hexamine medication? The cost of a prescription containing ammonium mandelate is high, but if the compensation paid to the patient while off duty were taken into account, the ultimate expense to the national health insurance funds would probably be less. Is it too much to ask that this drug should be included in the national health insurance formulary as soon as possible? Lastly, cannot some effort be made to create standard names for the more effective hormone preparations, in view of their increased efficacy and decreased cost? The trade names of these are rapidly becoming legion, and seem to me again to have outgrown the realms of easy reference. I feel that these deficiencies might in some way be overcome for the benefit of the general practitioner, among whose cases most opportunities for the exhibition of the drugs occur.—I am, etc.,

Grangemouth, Scotland, Jan. 4. J. M. HENDERSON, M.B.

Bacillary Dysentery

SIR,—Dr. Reginald Miller's paper on Sonne dysentery in the *Journal* of January 8 (p. 64) is a timely reminder that bacillary dysentery is endemic in this country, contrary to general belief. It is comparatively common in villages in agricultural districts where domestic wells and earth closets are the rule; and it is not unusual to find from time to time that diarrhoea "goes through the village." These cases present in a mild degree the usual dysentery syndrome of colic, frequent stools, passage of blood and mucus, and tenesmus, and over and over again I have found them to be associated with one or other of the dysentery bacilli. I have no doubt that a number of them are later diagnosed as "ulcerative colitis" because their original nature has been unrecognized, appropriate treatment has been lacking, and the patients have become secondarily infected. Moreover, they have never "been abroad."

The causative organism may, and does, vary in kind and virulence in different epidemics. Fortunately in this country it is the exception for the virulence to be of a high order: yet it will be recalled that a number of deaths occurred during recent drought years and that several members of one family died near Wantage from drinking water taken from the River Lambourne. Flexner Y was isolated.

The degree of severity depends doubtless on the virulence of the particular strain of organism concerned and the degree of immunity of the individual; but, as is well known, it varies within wide limits. At one end of the scale slight abdominal discomfort and the passage of one or two loose stools; at the other, death from toxaemia before the patient has passed a single typical dysenteric stool. I have seen *Bact. shigae* isolated from a comparatively mild case and *Bact. sonnei* from one of much severity. The more I see of it the less do I feel inclined on clinical grounds alone to associate any particular organism with a "clinical type." The dysentery syndrome indicates an acute infective ulcerative colitis—and that is about as far as it is safe to go on purely clinical grounds without guessing.

With regard to the vomiting mentioned by Dr. Miller, may I suggest that this may be purely toxaemic? After a day or two more or less ketosis is sure to be present; and if acetone be not noticeable in the breath ketone bodies will be found in the urine, due to starvation. Whether in the presence of toxaemia this is as harmless as uncomplicated starvation-ketosis I am not prepared to

say. Thirst is a common symptom, and in children especially I prefer to give some form of effervescing saline *ad lib.* This should be given when the effervescence has subsided. It relieves nausea and vomiting, corrects ketosis, and, most important of all, promotes elimination of toxins by bowels and kidneys as well as supplying fluid. In children this and repeated small doses of colloidal kaolin will be found adequate for ordinary cases. It is always important to identify the organism at the earliest possible moment in case antiserum might be necessary. The great bulk of a polyvalent serum makes its use very undesirable. From my own limited experience of the dysenteries I should say that Dr. Miller need not fear dehydration. Although the stools may be uncountable they are scanty and mucoid, not profuse and watery as in cholera. If he has any doubt about it determination of the specific gravity of the blood by Rogers' method is simple and will settle the matter.

As regards clinical diagnosis, I think the points are: (*a*) the epidemic character, (*b*) the rise of temperature, and (*c*) the dysentery syndrome. An uncomplicated dysentery should never be confounded with an intussusception; but in a child with bacillary dysentery intussusception might occur very rarely. Dysenteric ulceration may, of course, occur in the appendix. Fortunately it is the common things which usually happen. The abdominal type of subtertian malaria need not be considered in England. A brief microscopical examination of the cellular contents of the stool, pending cultivation or agglutination, will be found very informative.

I am glad to see that Dr. Miller emphasizes the need for rapid cultivation of the stools. If sent through the post they are quite likely to give a negative result. It is worth mentioning that specimens emulsified with glycerin-saline may remain active and culturable even if left in the laboratory over the week-end. In conclusion, I am sorry Dr. Miller did not give us fuller details of the way he feeds his patients, in view of its great importance. They often express a desire for food long before it is safe for them to have it.—I am, etc.,

H. M. STANLEY TURNER.

Ashtead, Surrey, Jan. 8.

SIR,—The article by my friend Dr. Reginald Miller on Sonne dysentery contains some remarks on treatment which may give rise to comment. He dismisses the use of sulphates with barely veiled contempt, although I had felt that the use of these salts was based on a reasonable attempt to understand the pathology of the disorder, the physiological activity of the colon, and the pharmacological action of these remedies.

The treatment he advocates is similar to a method recommended in dealing with cholera about 1850—a method which my C.O. in 1918 suggested that I might try when confronted with a small cholera epidemic. Chalk was then used in place of the more modern kaolin, combined with opiates. The anus was plugged with linen and a tight T-bandage applied. Needless to say we did not use this method but conformed to the usual routine with intravenous salines. I should be sorry to see the use of sulphates abandoned for the scanty reasons put forward by Dr. Miller.—I am, etc.,

London, W.1, Jan. 9. PEARSE WILLIAMS.

Haematocolpos

SIR,—I was interested in Dr. A. L. Craddock's letter (December 25, 1937, p. 1304), and thought, as I saw a great number of these cases during my twenty-three years in Calcutta, my experience might be of help. My opinion is that they are never due to hymeneal blocks, but to failure in development of the Müllerian duct. This can be proved by microscopical section of the blocking membrane, for on its inner surface there is always columnar epithelium, whereas on the outer surface it is stratified. These cases can be divided into (1) haematocolpos; (2) haematocolpos plus haematocervix; (3) haematocolpos plus haematocervix plus haematometra; (4) haematocolpos plus haematocervix plus haematometra plus haematosalpinx; (5) haematocolpos plus haematocervix plus haematometra plus haematosalpinx plus haematoperitoneum. The important point is to determine under evipan or general anaesthesia by rectal and abdominal examination whether a haematometra exists with or without haematosalpinx, for if such is the case and the ordinary vaginal incision of the occluding membrane is effected there is a grave risk of organisms growing on a perfect medium, spreading upwards, and invading the tubes and peritoneum, leading to fatal peritonitis. Unfortunately I have seen this occur in six cases where the membrane was, shall we say, haphazardly cut for drainage. Therefore if one suspects this condition it is better to open the abdomen. If the tubes are full of blood they may be clamped at the uterine end, and then an assistant incises the membrane from below, and slow drainage occurs, which can be aided by intra-abdominal pressure; when the uterus has been emptied the sponge-holding clamps are removed and the tubes are milked empty into the uterus.

The whole object of this technique is to make sure that the tubes are completely empty of blood, for if they are perchance distended and the uterus alone is evacuated it is almost a certainty that the fluid will become infected, giving rise to an acute pyosalpinx, with infection of the peritoneum should a leak have occurred through the fimbria to the peritoneum, possibly resulting in death. There is just one more point, and that is that should the occluding membrane be merely opened from below, every care should be taken that no pressure on the abdomen is made, for should such a pressure be made and relaxed there is danger of suction of air into the cavity, perhaps carrying organisms. No douching should be permitted in any circumstances. In this country these cases of major degree are not so often seen as in the Tropics, as mothers more readily seek early advice. During the last four years I have had only five cases in hospital, and in one only was there haematometra present.

Should there be great distension of the tubes it is probable that conception will never occur, and some writers have advocated salpingectomy.—I am, etc.,

V. B. GREEN-ARMYTAGE.

London, W.1, Jan. 4.

Treatment of Psychoneuroses

SIR,—The thanks of those interested in psychotherapy are due to Dr. E. Fretson Skinner for his handsome acknowledgment (*Journal*, January 1, p. 42) that his first letter (December 11, 1937, p. 1196) did contain some exaggerations. I agree with him that it is undesirable that this correspondence should become a debate on the merits of rival methods of treatment, and that it should, if possible, be confined to the two questions which he has set forth—namely, how to prevent undue pressure on the staff of the neurosis clinic, and how the general practitioner can be induced to deal with at least some of his neurotic patients. He will do this only when we have demonstrated to him that a large proportion of these patients are not difficult to treat, while at the same time

admitting that there are others who will be very difficult indeed and who had better be sent to a doctor with special experience. We do, however, need to emphasize the fact that a large number are easily curable, and that the general practitioner should not hesitate to make the attempt. After all, a very large number of those now practising psychotherapy in this country began to do so when they were general practitioners, stimulated and guided by the pioneers, two of whom were mentioned in my previous letter (December 18, p. 1247).

It is indeed important that the doctor in charge of the clinic should not be overwhelmed by crowds of patients, but I do not think he is going to be helped very much by the deliberations of a committee. Such a body is more likely to put the subject to sleep. It would no doubt have many meetings, hear many witnesses, make some recommendations which would receive careful consideration, *et voilà tout*. I think that the doctors in charge of a clinic could do much more to help themselves. As Dr. Skinner points out, I stipulated for one clear hour at the first interview. I shall now ask for another clear hour for the second, and for many patients a third hour at the third interview. If the patient needs any more full hours his case is not a simple one; it may even be an incurable one, for there are incurable neuroses. It seems to me that at the present stage we should concentrate on the easily curable cases, for we ought to demonstrate to the unconverted members of the profession, especially to the teachers, that psychotherapy is worth while, and we shall only do this by curing a large number of patients. There are many important physicians and surgeons who do not yet believe that our labours are of much value for the present or of promise for the future.

I have asked for three clear hours at least for each patient. If the doctor is to have half a dozen new patients sent to him every time he comes to the clinic the thing cannot be done; yet the demand for these hours is not unreasonable. It is clear that every psychotherapeutic interview is, in respect of time consumption, as great an undertaking as an average surgical operation, and in my opinion it is as grave and important a procedure. If a surgeon were told every time he came to his clinic that he was to do six extra operations before he left, in addition to the work he had already planned out for himself, he would, I think, refuse to try. It seems to me that the doctor in charge of the neurosis clinic should explain to his colleagues that it is not only useless but often damaging to see a neurotic patient for a short period, and if his list is full he should say that he is sorry he cannot see another patient until he has cleared off those on it. This will create a waiting list for the department, and when, as is inevitable, it becomes a scandal because of its length, his colleagues who wish their patients to receive psychotherapy will agitate to have the staff of the department increased in numbers. So long as this department continues to allow itself to be a dump where every patient who is a bit of a nuisance to the physicians and surgeons can be sent and forgotten, nothing will be done. But if the department will stand up to the others something will be attempted. Back pressure of this kind will do more to bring about reform than any number of recommendations from some committee which has investigated the subject.

I do not think that three clear hours for one patient is too much to ask of the general practitioner; as things are, he spends more time than this on each of his neurotic patients in the course of a year. Dr. Skinner may feel that I have thrown overboard the patient whose case will take a long time. That most of us will have such cases is certain, but I think that until he has sufficiently impressed his colleagues and his board of management with the importance of his department he must confine himself to two or three long cases, and the others must await their turn until he is free. It is by such methods that the great masters have forced their views on the profession. Lister did not call for committees—he just went on demonstrating that his patients did not get septic fevers. We should, I think, do likewise.—I am, etc.,

London, W.1, Jan. 3. T. A. ROSS.

Early Diagnosis of Pulmonary Tuberculosis

SIR,—In the *Journal* of December 4, 1937, Dr. Geoffrey Marshall, in his address on the early diagnosis of pulmonary tuberculosis, refers to the tuberculin test both for humans and beasts, but does not state specifically what he means by the tuberculin test. For the last few years I have been puzzled as to why there should be so much confusion concerning the usefulness of tuberculin in testing for early phthisis as well as in treatment, and I have concluded that it must be partly due to the use of the Mantoux test only. This in itself is useless for detecting the presence of early and active tuberculous infection. The tuberculin test for diagnosing active infection, as I understand it, consists of the primary intradermal (Mantoux) test followed by subcutaneous injections of increasing strengths, up to 0.01 c.cm., every three or four days, the increases depending upon the degree of reaction obtained with the intradermal injection. Should a diagnostic rise of temperature follow with doses of less than 0.01 c.cm., then further injections are not necessary. It is not a *sine qua non* that an active case should give a positive Mantoux test, and the use of tuberculin is not as simple as it may appear. The late Dr. Robert Carswell always claimed that tuberculin had never really been tried out. In "Further Notes on Tuberculin" (*Medical Officer*, May 15, 1937) two cases are recorded, "A. C." and "W. R.," illustrating a negative and positive tuberculin test. "C. W." is a third case illustrating a positive reaction confirmed microscopically. For those interested in the use of tuberculin the table (p. 61) in *Tuberculin, its Vindication by Technique*, by A. Camac Wilkinson, should be of particular interest and value; also Dr. R. Carswell's article in the *British Medical Journal* of May 16, 1936 (p. 990), on the value of the negative subcutaneous tuberculin test.—I am, etc.,

West Wickham, Kent, Jan. 1. H. S. BURNELL-JONES.

Sulphonamide-P in Brucella abortus Infection

SIR,—The following case may be of interest.

On November 5, 1937, I saw an insurance agent, aged 33, who complained of having had "shivers" and of being unwell for the last three days. He had a temperature of 101.6° F., a pulse rate of 90 and a respiration rate of 22, but there were no other physical signs of disease. During the next few days he developed a slight cough, and his temperature ranged from 98° F. in the morning to 103° F. in the evening.

On the tenth day of the illness I put him on two 7½-grain tablets of sulphonamide-P (B.D.H.) four-hourly. The next day his spleen was palpable, and his post-pharyngeal wall was red and granular. On the twelfth day his blood agglutinated *Brucella abortus* 1:12,500 and *Brucella melitensis* 1:2,500, but was negative against typhoid and paratyphoid A and B. His temperature, pulse, and respiration were now normal. On the thirteenth day I ceased giving him sulphonamide-P, after he had taken in all twelve 7½-grain tablets. From then to the seventeenth day his temperature varied from 98° F. in the

morning to 99.4° F. in the evening. On the fifteenth day his spleen could no longer be felt. On the seventeenth day his evening temperature rose to 100.4° F., but after the nineteenth day, when his spleen again became just palpable, it did not rise above normal. I continued to record it night and morning until December 31. He was allowed up on the twenty-fourth day, and has now resumed his work.

Dr. Manson-Bahr, writing in Hutchison's *Index of Treatment* (tenth edition, p. 954) of infections by *Brucella abortus* and *Brucella melitensis*, says: "Treatment is essentially symptomatic. Quinine, salicylates, and antipyretics are often used, but have no action beyond the temporary relief of the symptoms in some instances, and as the disease runs a most protracted course the use of such drugs cannot be persisted in." The case I record is an instance of a heavy infection in which the fever settled down in nineteen days after one abortive relapse on the seventeenth day. There are many possible ways of explaining the shortness of the illness of this young man, but I would suggest that sulphonamide be given a trial in such cases of infection by those who meet them more often than I do.—I am, etc.,

Llandilo, Jan. 4. J. H. LLOYD.

Treatment of the Common Cold

SIR,—During the past seven years I have experimented with every new treatment in an endeavour to find a cure for the common cold. I long ago came to the conclusion that for a remedy to be of value in the treatment of this condition it must (1) be simple to administer; (2) act within twenty-four hours; (3) not restrict or inconvenience the patient; and (4) prevent the unpleasant sequelae of nasal catarrh, cough, and expectoration. It occurred to me that prontosil album might have some beneficial effect on such a mixed infection as the common cold. Consequently I began to try out the treatment some three months ago on members of my own family. The results were dramatic, so I proceeded to treat patients in my practice, and have to date just over 100 cases treated within the first forty-eight hours of developing a cold. The infections were of a varied nature—rhinitis, laryngitis, cough, etc.—some with slight pyrexia and some with gastric disturbances. In all cases the results were swift, positive, and, in those cases treated in the prodromal stage, most dramatic. The colds were aborted and sequelae prevented. I have not one failure to record so far. The only unpleasant effect noted was that about half the patients complained of slight general malaise while taking the drug, but all agreed that this lasted but a few hours and was infinitely to be preferred to the cold.

I give one 7½-grain tablet of prontosil album at 6 p.m. and two more tablets on retiring on the first day of the cold. Usually this is all that is necessary, especially if the cold is in the prodromal stage. This treatment is given fasting from two hours before the first tablet is taken until two hours after the next two tablets. In the case of a well-developed cold one further tablet is necessary the following night, and should be taken two hours after a meal. In any event a maximum of thirty-six hours usually sees the patient perfectly well. The dose that I have found well tolerated by children weighing over 5 stone is one tablet at night and one the following morning. For children over 3 and under 5 stone half a tablet night and morning, once only, is given. I have not treated any child smaller than this. I feel that my results at least justify further investigation.—I am, etc.,

London, W.7, Jan. 4. MICHAEL ELYAN.

The Problem of the Final M.B., B.S.Lond.

SIR,—I felt sure that Mr. Mitchiner was not himself responsible for the publication of my name on the document issued by the London Graduates Association and willingly accept his assurance that no discourtesy was intended to anyone who, like myself, might disagree with the association's manifesto.

Sir Ernest Graham-Little has raised a number of points in his letter which require an answer. It is perfectly true that I told him that I intended to support Mr. Mitchiner, even though his views differed from mine. I can still pray for his conversion, an exercise which would be waste of time in Sir Ernest's case. His memory is at fault, however, when he states that I made no protest to him regarding the inclusion of my name in the list of nominations.

I must thank him for correcting one of my statements. I should have said Court instead of Universities Grant Committee. I have, of course, no official knowledge of how the Court's attention was drawn to the small number of students in medical schools who take a university degree. I am, however, indebted to Sir Ernest for quoting the statement of the Court to the Senate, for it makes the position clear, but I would demur to the suggestion that the Board of the Faculty had "flouted the advice of the Court." The Court did not "advise" the Senate, it merely expressed a hope. It is because this "hope" is unlikely to be fulfilled that the Board of the Faculty recommended the Senate to consider other methods.

Sir Ernest accuses me of wishing to degrade the final University examination to the level of the Conjoint diploma. What I have done is to support the report of the Board of the Faculty of Medicine, which reads as follows:

"The Faculty Board agreed that it is desirable that a greater number of students should obtain the M.B., B.S. degrees than has been the case in the past, *but that the standard of the degrees must be firmly maintained.*" (The italics are mine.) "They think, however, that the possibility of devising an alternative mode of approach to the degrees should be explored, and that with this end in view the University might co-operate with the Royal Colleges of Physicians and Surgeons."

I should have thought it would be obvious that the "hope" of the Court could only be realized, under present conditions, by making the new syllabus of a standard comparable to that of the Conjoint diploma, and this the Board of the Faculty cannot recommend.

Sir Ernest states that the "competition of a lower qualifying examination (that is, the Conjoint Board) has become less serious in the last few years." It would be interesting to know on what grounds he makes this statement. It has been shown that only about 8 per cent. of London University students who have passed the second M.B. qualify by the M.B., B.S. examination only. This does not suggest much lessening in competition. To support his statement he quotes figures to show the increased entry of London University students into the medical schools. What bearing this has on his argument is difficult to see. On the other hand, it makes it more imperative for those who induce students to enter for the University course to see that they have a reasonable chance of obtaining a degree in the long run.

No one can be more severe on anyone who introduces irrelevant matter into a discussion than Professor Greenwood, and no one can be more skilled than he in obscuring an issue by the introduction of matters only very little relevant to the subject under discussion. The Curriculum Conference to which he refers in his letter published on

January 1 dealt with purely educational matters; but the present problem is economic as well as educational, for it has been shown that financial difficulties are a greater bar to men obtaining their M.B., B.S. degree than are intellectual difficulties. These economic matters are of no interest to the Universities of Oxford and Cambridge, and for that matter they are really of no interest to the Royal Colleges and the Society of Apothecaries, who would doubtless rather be left alone. On the other hand the University finds that the relative ease with which their undergraduates can obtain a qualification by way of the Conjoint Board affects materially the number who obtain a degree and, therefore, consultation with the Royal Colleges seems advisable. Your correspondents object to this on the grounds that these colleges are not teaching bodies and "can make little contribution to the solution of an educational problem." It would be interesting to know how they differ from the External side of the University of which Sir Ernest is the champion. Perhaps in Professor Greenwood's objection one can get a glimpse of the Academic Jekyll in the rather cynical External Hyde.

I venture to suggest, Sir, that the position in London is most uneconomic. We have two sets of final examinations conducted on more or less parallel lines, both of which cost a lot of money; we have two sets of examiners, busy men who often find that long hours of examining interfere seriously with their work and their teaching; we have the majority of London students sitting for the same type of examination twice over; and we have their parents paying for a double set of examinations. I believe personally that these two examinations should be merged into one, the standard being different for the Conjoint and University students. I cannot but believe that if some such scheme were introduced most of our difficulties would be surmounted. If Sir Ernest Graham-Little's and Professor Greenwood's view prevails we shall still see half our students without their degree, and the Royal Colleges will continue to increase those profits to which Professor Greenwood takes such objection.—I am, etc.,

London, W.1, Jan. 8. A. M. H. GRAY.

SIR,—This matter has interested me intensely for many years. As a member of the Standing Committee of Convocation (in the Faculty of Medicine) since 1927, and more recently as Bedell of Convocation, I have maintained close touch with my "alma mater" since graduating in 1924.

I have read with great interest the letters in your issues of December 25 and January 1 by Dr. A. M. H. Gray and Professor M. Greenwood; also the articles in the *Lancet* of October 23, and in *St. Bartholomew's Hospital Reports* (referred to by the *Lancet*) by Mr. W. Girling Ball. May I also remind your readers of the valuable correspondence on the same subject which appeared in your columns in November and December, 1934, in which Sir Ernest Graham-Little took part. When it is realized that of all the matriculated medical students in the University of London who pass their second M.B., Part II (equal to the Oxford and Cambridge B.A. and M.A.), only some 54 per cent. ever actually become graduates in medicine and secure the valuable M.B. degree, surely that is a scandal? After six years of study more men should actually become university graduates, with graduates' privileges, as opposed to mere diplomates. If possible, *all* should be graduates. The great majority of men who enter the medical schools of the London hospitals do so in order to get qualified, be able to practise, and earn a living, not merely in order to fulfil various academic regulations and to satisfy the academic pundits. There can be little doubt that the final M.R.C.S.Eng. examination is as sound a final qualifying test on the surgical side as anyone could wish for. I believe the M.R.C.S.Eng. is as good as any B.Ch. in the world. The London B.S. is a little harder on the surgical pathology side. It can scarcely be denied that there is a great difference between the standard of the men who just scrape through the Conjoint Board final and the men who satisfy the examiners at the M.B., B.S.Lond. final, and it would be impossible to hand out the London degrees to men who just passed the Conjoint. But surely it is absurd to be running two completely different final examinations in London—the Conjoint Board *and* the University—putting men to the double expense of 40 guineas for the Conjoint diplomas and 28 guineas for the University degrees?

My proposal is that a wide view should be taken of the whole matter: I believe the Colleges would recognize the cause of education and the needs of the student to be above that of mere money-making. I suggest that there be *one final examination in medicine* in London, with an extra part for the degree men. Students who had passed all the earlier Conjoint Board examinations would be pure Conjoint men, and in passing the new final examination would get their M.R.C.S., L.R.C.P. diplomas; on the other hand, the matriculated University of London students, who had only passed the second M.B., Part II, would get the Conjoint diplomas upon passing the ordinary new final examination, but would have to pass an extra part, in medicine and pathology, in order to get the M.B., B.S. degrees. It is in medicine and pathology that the main difference lies between the degree and diploma standards. Thus, three-quarters of the final test would be the same for all. An arrangement as to fees would have to be reached by the two bodies. It is the fact that, even when the Conjoint diplomas have been secured, an entire new final examination has to be taken in order to secure the M.B., B.S. degrees that causes many men to give it up altogether. Many men are by then doing house appointments. If when the Conjoint final had been passed three-quarters of the London final was also disposed of the great majority would complete the M.B., B.S. final by taking the extra quarter.—I am, etc.,

CHARLES A. H. FRANKLYN, M.D., B.S., M.R.C.S.

Lincoln, Jan. 3.

West London Hospital Medical School

SIR,—In your issue of December 25 (p. 1305) "Cambridge Woman Graduate" puts forward a plea for the undergraduate members of her own university who find themselves at a disadvantage, compared with their London sisters, in obtaining entry into the London medical schools. At the present moment we have had some twelve applications from Cambridge women, and all of these have been accepted. As this represents practically half a normal year's entry, I think we can plead not guilty to any charge of discriminating against Cambridge women; moreover, we have also accepted a number of women from that older and more enlightened university which admits women to all the privileges of membership.

In the *Journal* of January 8 Dr. Eva McCall draws attention to the paucity of hospital appointments open to women medical graduates. The West London Hospital will, before long, be in a position to offer at any rate a partial solution to this difficulty. In the article which appeared in the *Journal* on December 4 (p. 1124) it was pointed out that both resident and honorary appointments

will eventually be available for suitably qualified women. It is, however, an interesting commentary on Dr. McCall's complaint that we have recently advertised a vacancy for an honorary paediatrician without receiving a single application from a woman.

Dr. D. E. Barton (January 8) has, I think, read into the article to which he refers a significance which was never intended. I should have hoped that he would welcome the fact that there is not at present—and I hope there never will be—any statutory exclusion of men from our school. This does not mean, as he seems to fear, that the women will gradually be elbowed out to make room for men. But it does mean that there will be the possibility for the ultimate development of a true mixed school with absolute equality for students of both sexes—a type of school which does not exist in London at the present time. There is already an excellent school for women only, but I have gained the impression that there is a keen demand among women of all generations for a mixed school of the type I have indicated. The West London Hospital Medical School is committed to the service of women students, and their interests must naturally come first. But it does not appear that they share the prejudice of men students against co-education in medicine.

The reason why the future "cannot be foreseen" is that we do not know how many women will be applying for admission, nor how long this prejudice of the men will persist.—I am, etc.,

MAURICE E. SHAW,
Dean.

West London Post-Graduate College,
London, W.6, Jan. 8.

Applying for Hospital Posts

SIR,—The letters of "Gamma" (*Journal*, December 25, p. 1305) and others on applying for hospital appointments recall to many of us our own rueful experiences in similar circumstances. The fetish, albeit a lucrative one, of a hospital appointment has introduced methods and morals savouring more of the common gangster than those of a learned and honourable profession. The method of appointment to the staff of certain provincial hospitals has degenerated into what amounts to a racket, and is far worse than any system of fee-splitting so rightly frowned upon by men of honour. Most of the appointments to the junior staff of such provincial hospitals go by favour to the man who has bought himself in, either as a junior partner of some member of the existing staff or by purchasing the practice of such a member. It is common knowledge that professional qualifications and experience count for very little; what matters is a friend at court, and for this the lay members of the hospital committee lay themselves open to influence when it comes to votes. Hospital committees continue the farce of advertising staff appointments and candidates go to trouble and expense to produce testimonials and applications, while all the time some one candidate has been earmarked for the post. Again and again men suitable from every point of view as regards professional and personal qualifications are turned down for some junior partner not half so well qualified. The question arises, What, if anything, can be done to alter a state of affairs so lowering to the profession and harmful to the service of the public? The answer is nothing—unless we care to adopt the only fair and reasonable system of "open" hospitals, such as they have in many parts of Canada. Take, for instance, the General Hospital, Vancouver, which contains about twelve hundred beds and is one of the finest hospitals in the West. It has no honorary staff, and any man on the Medical Register has the right to take his patients into this hospital and treat them there himself. If he finds the case beyond his powers he calls into consultation one of the specialists he believes in, unlike his British colleague, who has to make his choice from some member of the honorary staff in whom he may not have the slightest confidence. However, in England the system of honorary staffs is so well dug in and so surrounded by the barbed-wire entanglement of vested interest that nothing but the advent of high explosive in the shape of the coming corporate State is likely to break down its smug security.—I am, etc.,

Bournemouth, W., Jan. 5. VINCENT NORMAN.

Pasteurization of Milk

SIR,—The idea that medical opinion is in favour of pasteurization of all milk is being so cunningly inserted into the mind of the public that I am moved to give you some of our experience. The council to which I have the honour to belong has for years now taken great interest in improving the quality of the milk supply. This it does by taking frequent samples from all the purveyors of milk in the district, and, where a sample is not good, the sanitary inspector takes it up with the producers. The result has been very satisfactory. We have among our producers one by whom the milk is pasteurized. The equipment is absolutely the most modern and the methods used are entirely up to date. Now let me give you an extract from our annual report for 1936.

Pasteurized Milk (Number of bacteria per ml.): Average count, 23,196; lowest count, 60; highest count, 112,000.

B. coli present in 1 ml.	... ...	2 samples
" " " 1/10 ml.	... ...	2 samples
" " " 1/100 ml.	... ...	2 samples
" " " 1/1000 ml.	...	1 sample

Certified Milk and Tuberculin-tested (Certified Milk): Average count, 9,880; lowest count, 900; highest count, 24,800; *B. coli* absent.

The following is a copy of a report given at our last council meeting. As *B. coli* was present in only one sample of ordinary milk, simply the number of bacteria per millilitre is recorded.

Ordinary Milk Sample No.	Bacteria per Ml.	Ordinary Milk Sample No.	Bacteria per Ml.
80	56,000	83	40,000
81	72,000	84	64,000
82	48,000	88	28,000

T.T. Milk	Sample	89	46,000
Accredited Milk	"	90	20,000
Sterilized Milk	"	86	200
Pasteurized Milk	"	85	25,200
T.T. Certified Milk	"	87	5,300

These results are good and show that pasteurized milk, in spite of all the elaboration and expense entailed in its production, has nothing to boast about. The great need to-day is for an abundant supply of fresh, pure milk at as cheap a price as possible, and I believe that if our Government and local authorities were really determined that the people should have this many difficulties would disappear and a natural supply would become available. Pasteurization is a second best, and may easily become a dangerous second best. We have definite evidence that our certified T.T. milk has produced better results than any other milk. It seems to me very probable that this pasteurization campaign may very easily seriously retard the campaign for pure milk and healthy cattle in this country.

May I add a few notes from our sanitary inspector, Mr. Jump, because we really have gone into this matter pretty thoroughly.

"If it had not been essential for the dairy trade of to-day (a series of large combines collecting milks of various ages over a wide area) to find some system whereby they could ensure delivery to the consumer in a sweet condition, it would appear doubtful that general pasteurization of milk would ever have come to the fore. There are many types of pasteurizing plants in operation to-day, both under licence and otherwise, but it seems doubtful whether every pint of milk treated is pasteurized in the true meaning of the word. Under the Special Designations Order the milk has to be held at a temperature of not less than 145° F. and not more than 150° F. for a period of half an hour. This gives a temperature range of five degrees. Actually in practice there is not this margin, as the trade problem of the 'cream line' causes strong opposition from the average dairyman to a temperature exceeding 148° F. Thus in practice the margin is three degrees. Some plants have a heat loss of two and a half degrees. Under these conditions the plant has to be truly efficient and the human element almost perfect to achieve true pasteurization. In checking the temperatures recorded, the fact that thermographs are exceedingly delicate instruments must not be lost sight of. Unless the thermographs are constantly and regularly corrected the temperatures recorded will be found to be misleading. Most systems of pasteurization involve the use of comparatively long lengths of pipe lines. Unless these can be effectively sterilized the milk becomes contaminated after pasteurization."

Under these circumstances it would appear that the day of universal pasteurization has not yet arrived, and that if a compulsory scheme were put into operation there would undoubtedly be a false sense of security.—I am, etc.,

Letchworth, Jan. 5. NORMAN MACFADYEN.

Correct Footwear

SIR,—The considerable correspondence on this subject in recent numbers of the *Journal* emphasizes its importance in the treatment of many disabilities. In a letter which you published nine years ago (March 30, 1929) I mentioned that nearly thirty years previously I had purchased boots of the correct shape from the firm of Holden Brothers, whose business then had been transferred to Messrs. Holland and Son of London. As Dr. T. Hare has stated, socks and stockings also need supervision as to size and shape, and especially is this the case with children, whose socks, shrunk by frequent washing, become so small that the effort required for their removal is very evident, and the result of their use that of a tight bandage with distorting compression of the bones of the toes. Allow me to add that I have no financial or other interest in the firm mentioned above.—I am, etc.,

W. W. SHRUBSHALL, D.P.H.

Work of the R.M.B.F.

SIR,—I am extremely grateful for the most generous response which has been made this year towards our Christmas gift fund. The amount subscribed, £979 3s. 8d., has enabled us to give a Christmas gift of 30s. to every one of our regular beneficiaries.

My thanks are due to you, Sir, for bringing the appeal before your readers, and to all who responded we desire to express our very sincere thanks. The committee is equally indebted to the many secretaries of medical societies, panel committees, hospital staffs, and Divisions and Branches of the British Medical Association who brought the Christmas gift appeal to the notice of their members and who arranged for collections to be made at meetings or donations to be voted. No fewer than 115 cheques from the above-mentioned secretaries, amounting to £511 15s. 8d., have been received.

We are particularly impressed by the spirit of good will and friendship shown towards the work of the Royal Medical Benevolent Fund in the letters received from many contributors. Practically all "wish every success to the appeal"; others refer to the object of the appeal as "being most deserving." It is clearly shown that it is the desire of members of the medical profession to extend sympathy and practical help through the agency of the Royal Medical Benevolent Fund to those members or their dependants who are living in adversity. The extent to which such help is appreciated may be gathered from this extract from one of many letters of thanks from beneficiaries. The writer is a widow, aged 63, suffering from asthma and bronchitis:

"Will you please give my sincere thanks to the committee for the generous and unlooked-for Christmas gift. It came as a most timely gift. A month ago my doctor ordered me to bed and said that the fire must be kept going night and day, so instead of a 2s. 8d. bag of coal I was able to get a quarter of a ton. I felt it was being very extravagant, and yet on Christmas Eve, after the light was turned out, it was lovely to lie in bed and think of all the blessings one was enjoying through the kindness of unlooked-for friends."

My committee is confident that it is the wish of all that the Royal Medical Benevolent Fund should be worthy of the traditions of our great profession—to be able to give adequate help to those in need. Great advance has been made since the early days and much has been done. We look now to those who have not yet become annual subscribers to join in with us during 1938.

I wish all a happy New Year, and I thank you for the generous co-operation extended by you and your readers to the Royal Medical Benevolent Fund.—I am, etc.,

THOS. BARLOW, President.

11, Chandos Street, Cavendish Square, W.1, Jan. 5.

Obituary

R. D. HELM, M.D.

Consulting Physician, Cumberland Infirmary

The death of Dr. Robert Dundas Helm at his residence in Carlisle on January 4 following a short illness has removed a physician with a widespread reputation in the North-West, and one who was, in other respects, a valuable and esteemed member of the community.

A native of Fifeshire and born in 1863, Dr. Helm graduated M.B., C.M. of Edinburgh University at the age of 21, and took his M.D. four years later. After graduation he held the appointments of house-physician to the Edinburgh Royal Infirmary and to the Royal Hospital for Sick Children, Edinburgh, and of house-surgeon at the Royal Maternity Hospital, Edinburgh. Following this he came in 1885 to Carlisle as assistant in an extensive county practice. He succeeded to this practice in 1889 and carried it on till the time of his death. In 1896 he was appointed honorary assistant physician to the Cumberland Infirmary, and a year later, on the retirement of Dr. Lockie, he became full physician, serving in this capacity till 1922, when he was appointed consulting physician to that institution. The governors further honoured him by electing him a vice-president. Another institution with which Dr. Helm was long associated and which was dear to his heart was the Border Counties Home for Incurables, Strathclyde House, Carlisle. He served there as honorary physician from 1921, and on the death of Sir Frederick Chance in 1932 he succeeded

to the presidency of the institution. When the British Medical Association held its Annual Meeting in Carlisle in 1895 Dr. Helm acted as honorary local general secretary, and at the Edinburgh Meeting in 1898 he was honorary secretary of the Section of Pharmacology and Therapeutics. He was also a past president of the Carlisle Medical Society. During the great war he acted as medical officer in charge of the military hospital at Carlisle Castle. He was appointed a magistrate for Carlisle in 1896, and had been the city's senior magistrate since 1936.

Dr. Helm was a physician of the old school. For many years in Carlisle he had an extensive general practice among the upper classes, and his services were soon widely sought in consulting medicine throughout Cumberland and the neighbouring counties. He had a great natural charm of manner and was friendly and courteous with all, in whatever class, and his passing will be deplored by his many patients and by his colleagues, each one of whom will remember him as a true gentleman in every sense of the word.

EDWARD MAGENNIS, M.D.

Formerly President, Irish Medical Association

Dr. Edward Magennis sen., who represented the Apothecaries Hall of Ireland on the General Medical Council for twenty years and was elected to the Irish Free State Medical Council in 1927, died on January 3 at the age of 82 at his home in Harcourt Street, Dublin. He made a lifelong study of ophthalmology; took a deep interest in public health affairs, especially those relating to the welfare of children in schools; and was the author of books and papers on these subjects.

Edward Magennis was a native of Co. Down, and received his medical education at Queen's College, Belfast, and at King's College, London. He obtained the L.R.C.P. and S.Ed. in 1880, the M.D. of the Royal University of Ireland in 1884, and the D.P.H. of the Irish Royal Colleges in 1891. In early professional life he was for a time clinical assistant at the Royal London Ophthalmic Hospital; then, returning to Ireland, he was appointed ophthalmic and aural surgeon to St. Michael's Hospital, Kingstown. He took the licence of the Apothecaries Hall, Dublin, in 1908 and represented that body on the General Medical Council continuously from 1914 to 1934, and was also for many years a member of its Court of Governors. He had been a justice of the peace for Counties Down and Armagh, president of the Irish Medical Association before its reorganization, and held important positions in other public bodies.

T. K. WHEELER, M.D., M.CH.

Consulting Surgeon, Royal Victoria Hospital, Belfast

The death on December 29, 1937, of Dr. Thomas Kennedy Wheeler in his ninetieth year has removed from Belfast life a figure who provided a link with past generations, for he obtained his M.D. in the Royal University of Ireland in 1879. The Wheeler family has had an outstanding place in the medical life of Belfast for many generations. The late Dr. Wheeler was the son of a doctor well known and much esteemed by the older inhabitants, and he himself was the father of four doctors. He maintained his faculties until the last, but increasing physical infirmity became manifest during the past few weeks. Even his interest in his beloved pastime of bowls was sustained up to last summer.

Dr. Wheeler had a long, active, busy professional life. His patients were numerous and every one he could consider his friend. He was a member of the surgical staff of the Royal Victoria Hospital, and for some years had been one of its consulting surgeons. A unique record was created some years ago when his son, James R. Wheeler, F.R.C.S., was elected assistant surgeon to the eye and ear department of the hospital, two generations thus holding appointments on the honorary staff. He was also a former surgeon to the Ulster Hospital for Children and Women, and did valuable service there in the surgical department. To his other professional activities were added those of medical officer to the Methodist College, Belfast. In sport he always found a congenial subject of conversation, and in the distinguished place occupied by his sons in Rugby football he took a great pride. His only daughter, Eleanor, who was also a doctor, succumbed to illness some ten years ago, and her death was a blow to her parents, which was borne with a fortitude won from life and experience. Three of his four sons are in the medical profession: Donald R., assistant surgeon to the aural department of the London Hospital; Arthur R., in practice in Wiltshire; and James R., who specializes in ophthalmology in Belfast.

Dr. FLORENCE ROBINSON of Manchester died at her home on December 27, 1937, aged 65. Dr. Robinson received her early education at the Manchester High School for Girls, and since at that time women students were not admitted to the Manchester Medical School she went to the London (Royal Free Hospital) School of Medicine for Women, taking the L.S.A. in 1900 and the London M.B. degree in the following year. After brief periods of residence as house-surgeon in the St. John's Hospital, Lewisham, and the Clapham Maternity Hospital, she returned to Manchester. Together with Dr. Catherine Chisholm she was to a large extent responsible for the foundation of the Babies' Hospital, which has since become the Duchess of York's Hospital for Babies, Burnage, to which she was appointed an honorary physician. Dr. Robinson had been a member of the British Medical Association from 1905 up to her retirement from practice about two years ago.

By the sudden death of Dr. JOHN COWAN WILSON on January 7, at the age of 75, Lanarkshire lost one of its ablest general practitioners who had been a member of the British Medical Association for thirty-two years. He graduated in medicine at Glasgow University in 1883 and took the D.P.H. of Cambridge in 1890. After a short term as house-physician in Greenock Infirmary he started practice in Blantyre, the birthplace of David Livingstone, who would certainly have respected him both for his character and his work. It is not an attractive spot, but there for fifty-three years Wilson gave of his best, and it was a good best—better than most of his patients could readily appreciate, for he kept in close touch with recent developments in medicine and surgery and was himself an excellent surgeon. It was largely due to him that the cottage hospital and the nursing association at Blantyre came into being. His service to the miners and to the poor was as painstaking as to the rich and was never stinted. This was recognized three years ago when the folk of Blantyre celebrated his jubilee among them and publicly honoured him. It was characteristic of him that though he knew he had angina he was at work two days before he died. Always a gentleman, courteous in manner, kind but determined, Cowan Wilson was in the true line of succession to the grand type of family doctor of whom Scotland has had many, and to whom "R. L. S." and "Ian Maclaren" bore witness last century. And, but for his polish, he might have sat for the portrait of "The Auld Pairish Doctor" so ably drawn by our contemporary, Dr. John F. Fergus. The sympathy of the whole community goes to the widow and her two sons.—J. A.

We regret to announce the death at Margate of Dr. WILLIAM WATSON GRIFFIN, who before his retirement practised at Brighton as an ophthalmic surgeon. His medical education was at Otago, New Zealand, and the London Hospital. He graduated M.B., B.Ch. in New Zealand, and held the post of assistant house-surgeon at Dunedin Hospital, later taking his F.R.C.S. in England. He was appointed ophthalmic surgeon to the Royal Sussex County Hospital and also to the Worthing Hospital. He had previously held the posts of senior clinical assistant at the Royal London Ophthalmic Hospital and clinical assistant in the ophthalmic department of the Middlesex Hospital. During the great war he was appointed ophthalmic specialist in the R.A.M.C.(T.), holding the rank of major, and served in that capacity throughout the duration of hostilities. At the Annual Meeting of the Association in Brighton in 1913 he was a vice-president in the Section of Ophthalmology. His fellow practitioners in Brighton have the most pleasant recollections of his work as an eye specialist. He was a colleague on whose opinion they could always rely and unfailingly courteous in all his dealings. It can be said of him that he had a delightful personality, and Brighton doctors will regret the loss of a very distinguished member of our profession.

The following appreciation of Dr. A. COWAN GUTHRIE is by a Glasgow practitioner who acted in consultation with him: From his first days in the study of medicine Guthrie's mind turned to pathology, and after a time in general practice he gave himself up to the study of disease by the specialized methods of laboratory work, bacteriology, histology, and microscopy. He brought to bear on his cases an acute mind in advance of his time, a careful clinical observation, and an originality of thought and action, which made him as a consultant an unusually interesting and helpful guide to both patients and doctors. Those who experienced his attention could not fail to be impressed by the combination of great clinical skill, keen scientific acumen, and freedom from the fetters of convention and tradition that distinguished all his work.

We announce with regret the death of Dr. FREDERICK VAUDREY CANT at the age of 46. Dr. Cant died in the Salford Royal Hospital on January 2 as a result of injuries received in a motor accident on New Year's Eve. He was educated at Cambridge and at the Victoria University, Manchester, taking the Cambridge B.A. in 1912 and going on to the M.R.C.S. and the L.R.C.P. diplomas in 1915. During the war he held a commission in the Royal Army Medical Corps. In 1920, after proceeding to the M.A., he went to Bath, becoming honorary anaesthetist at the Children's Orthopaedic Hospital and senior medical officer to the Ministry of Pensions Hospital. While there he took the D.P.H. at the University of Bristol. He went to Manchester about three years ago, and was appointed chief medical officer to Manchester Collieries Ltd. He had been a member of the British Medical Association for the last twenty years.

Dr. LAWRASON BROWN, resident physician at the Trudeau Sanatorium, Saranac Lake, U.S.A., from 1900 to 1912, died on December 26, 1937, at the age of 66. He had been ill for several months after an attack of pneumonia.

The following well-known foreign medical men have recently died: Professor ERICH LEXER, the master of restorative surgery and director of the Munich University surgical clinic, aged 70; Dr. FERNAND LALESQUE, an eminent physiotherapist and author of numerous works on the treatment of tuberculosis and creator of Arcachon as a health resort, aged 84; Dr. FERNAND CURTIS, for thirty-five years professor of morbid anatomy at the Lille Faculty of Medicine and author of works on insulin and on cancer, aged 80; and Dr. VAN ROEY, rector of Amsterdam University and professor of gynaecology.

Medico-Legal

A DOCTOR'S DAMAGES FOR LIBEL

Sabapathi v. Huntley

A planter named G. Huntley and his wife had a serious motor-car accident when driving by night in Ceylon. They were taken to a Government hospital, and at once attended and treated by Dr. C. Sabapathi, a senior medical officer of the Government of Ceylon with British and Indian qualifications, who was in charge of the hospital. He visited them next day, and the day after that they left the hospital. Mr. Huntley wrote him a note two days later asking for the accounts, and saying that he and his wife were both very much better and grateful for the way in which they had been looked after. About a week afterwards they consulted a specialist in Colombo, and the *x*-ray examination made on his advice showed that both patients had fractures. They were accordingly treated in a nursing home. Shortly after entering the home Mr. Huntley wrote to the Director of Medical and Sanitary Services, Colombo, a strong complaint against Dr. Sabapathi for negligence and incompetence, alleging that the doctor, after a very perfunctory examination, had pronounced definitely that no bones were broken, had not suggested an *x*-ray examination, had actually intimated that the patients might leave on the following morning, and had made no examination of any sort while they were in his hospital except the first examination of two or three minutes, after which he had merely prescribed lead lotion and the usual liniments and had left everything to the acting matron. Mr. Huntley also sent a copy of this letter to the chairman of the Planters' Association, which passed a resolution endorsing its terms. The letter, the discussion, and the resolution were published in several newspapers. Dr. Sabapathi was given no opportunity of explaining or justifying his conduct.

The doctor complained to the Director of Medical Services, and Mr. Huntley said in an interview with the Director that the doctor had examined him and his wife while they were still in the car, and each examination had lasted only half a minute. Dr. Sabapathi then, with the consent of the Government, brought an action for libel and slander against Mr. Huntley. This was tried by the district judge. The doctor gave evidence that he had not examined either patient in the car, but had made a careful and complete examination of both in bed, and had immediately recorded on their bed-head tickets the injuries which he had observed and the opinion "No evidence of fracture." Mr. Huntley, on the contrary, said in evidence that the doctor had examined him and his wife in the car, had felt and moved their arms and assured them that no fractures were present, and when he examined them in the hospital had looked only for cuts and bruises, and had not touched or re-examined their arms and shoulders for fractures. The district judge found in favour of the doctor, accepting his evidence and disbelieving that of Mr. Huntley and his witnesses. He also held that Mr. Huntley's communication to the Planters' Association was not made upon a privileged occasion, and that, if he were wrong in so holding, Mr. Huntley had in making it been actuated by malice so that he could not claim the benefit of privilege. Mr. Huntley appealed to the Supreme Court of Ceylon, who reversed the judge's decision and found in his favour. They agreed that the occasion was not privileged, but found that Mr. Huntley had not made the communication maliciously and that he had proved the truth of his statements.

The Judgment of the Judicial Committee

Dr. Sabapathi then appealed to the Judicial Committee of the Privy Council, who delivered judgment on December 21, 1937. They pointed out the difficulties which hindered Mr. Huntley, like any plaintiff, in proving that he was justified in making his defamatory statements. His first obstacle was to overcome the judgment of the district judge, who saw and heard the witnesses and was thus better able than the Supreme Court to judge of their demeanour and credibility on a pure question of fact: Powell *v.* Streatham Manor Nursing

Home, [1935] A.C. 243. Moreover, Mr. Huntley's statements were antecedently improbable. The evidence showed that Dr. Sabapathi had been in the Government service for twenty-two years, but had never before been accused even of inattention, far less of incompetence and negligence; that members of the Planters' Association were not slow to complain of medical inattention on the smallest provocation; and that Mr. Huntley suggested no motive or explanation at all to account for the negligence he attributed to the doctor. Moreover, the sweeping character of the allegations made them difficult to justify. Lastly, their Lordships said, the plea of justification almost necessarily postulated that the doctor was guilty of perjury and conspiracy, for if Mr. Huntley were right the doctor and his acting matron must be regarded as parties to a plot to bolster up the plaintiff's claim, to deceive the court, and to frustrate the ends of justice. On the other hand, Mr. Huntley was his own main witness, and it was not only charitable but indeed probable to suppose that the accident and shock might have impaired his recollection. He had stated in evidence that he was quite clear on some points and not on others. Their Lordships, in assessing the truthfulness of the evidence, remarked that the Supreme Court of Ceylon had found Mr. Huntley to be wrong in saying that there was an examination in the car and not in the ward, and that if the alleged examination in the car were not only an afterthought but also an untruth, that conclusion cut very deep into Mr. Huntley's case.

They considered the bed-head tickets to be even more significant. These disclosed a course of normal, competent, and careful treatment, and a diagnosis, not of no fracture, but of no signs of fracture—a very different thing. They also disclosed that the doctor visited Mr. and Mrs. Huntley on the morning before they left the hospital—a visit which Mr. Huntley denied.

Duty to Advise X-Ray Examination

The Judicial Committee found it clear that until the *x*-ray examination was made it had not occurred to Mr. Huntley to make any charge against the doctor. He had actually said in evidence that until the fractures were discovered he had thought the doctor's examination an ample one. The charge which the Supreme Court affirmed against the plaintiff, and upon the affirmation of which they regarded his negligence and incompetence as established, was his failure to advise an *x*-ray examination. The proposition affirmed by the Supreme Court would seem, said the Judicial Committee, to run thus: after a motor-car accident the attending physician must advise resort to a radiologist, and if he omits to do so he displays both incompetence and negligence. This proposition, said their Lordships, is far too wide. The *x*-ray examination must always depend on the circumstances, such as the condition of the patient, the character of the injuries, and the accessibility of the apparatus. They thought that Dr. Sabapathi's position had been clear and consistent throughout. He found no evidence of fracture; he allowed the patients to go home, instructing them to let him know how they progressed. If their pain and other symptoms had continued unabated for a week he would no doubt have advised an *x*-ray examination. When he received the letter saying that they were much better it was not surprising that he concluded that the worst was past. No witness said that to await developments for a week before advising an *x*-ray examination *per se* constitutes negligence or incompetence in a physician.

Their Lordships therefore found that Mr. Huntley's plea of justification failed. They agreed with both the lower courts that the occasion was not privileged; they agreed with the trial judge that Mr. Huntley was actuated by malice when he wrote the letter, and must have known that its terms were false. They pointed out that the finding of the trial judge on the question of malice was a finding of fact, and saw no reason for disturbing it. The state of a man's mind, they remarked, is as much a fact as the state of his digestion. They thought that the verbal statements made to the Director of Medical Services were made on a privileged occasion, but were not protected because they were made maliciously. They therefore allowed the doctor's appeal, and with it the damages awarded by the trial judge—Rs.10,000.

The Services

DEATHS IN THE SERVICES

Surgeon Rear-Admiral Sir DANIEL JOSEPH PATRICK MCNABB, K.B.E., C.B., R.N. (retired), died in Deal Hospital on December 25, 1937, aged 75. He was born at Greenock on October 11, 1862, the eldest son of the late Mr. Thomas McNabb of Newcastle-on-Tyne and Southsea. He was educated at St. Cuthbert's College, Ushaw, at Durham University College of Medicine, and at the London Hospital, and took the L.R.C.P. and S.Ed. in 1884, and the M.R.C.S.Eng. in 1886. Entering the Navy in 1886, he became staff surgeon in 1898, fleet surgeon in 1902, and served on the staff of Sir John Jellicoe in 1912. In 1914 he became Deputy Surgeon-General, and was in charge of the transport of Belgian wounded after the fall of Antwerp. For this work he received the Order of Commander of the Crown of Belgium. His rank was changed to Surgeon Captain in 1918. From 1916 to 1919 he was Deputy Director-General of the Medical Department of the Navy, and afterwards was in command of the Royal Naval Hospital at Plymouth, retiring in 1922. He was a naval member of the Medical Consultative Board in 1920. He received the C.B. in 1918 and the K.B.E. in 1919.

Surgeon Rear-Admiral THOMAS TENDRON JEANS, C.M.G., R.N. (ret.), died at Southsea on January 4. He was educated at Manchester, and took the M.B.Lond. in 1893 and the M.R.C.S., L.R.C.P. in the same year. After filling the post of clinical assistant at the Manchester Cancer Hospital he entered the Navy as surgeon in 1894, became staff surgeon in 1902, fleet surgeon in 1910, surgeon captain on June 30, 1922, and retired as surgeon rear-admiral on January 19, 1926. He served in the South African War of 1899–1900, in the Orange Free State (medal), and in the war of 1914–18, serving on the Dardanelles and on the Suez Canal, receiving the medals, and in August, 1919, the C.M.G. During the latter part of the war he was senior medical officer at Portsmouth Barracks, and later in the hospital ship *Soudan*. From 1919 to 1922 he was in charge of the naval hospital at the Cape of Good Hope, and from 1922 to 1926, as surgeon captain, at the head of the naval hospital at Plymouth. He was editor and part-author of *Naval Brigades in the South African War, 1899–1900*. Before the war of 1914–18 he wrote several stories of sea life in the Navy, including *Ford of H.M.S. Vigilant, Mr. Midshipman Glover, R.N., On Foreign Service, or the Santa Cruz Revolution*, and *John Graham, Sublieutenant, R.N.*, the last being published in 1913. After retirement he published an autobiography, *The Reminsiscences of a Naval Surgeon*, in 1927.

Surgeon General THOMAS MAUNSELL, C.B., LL.D., Army Medical Services (ret.), died at Hillingdon Court, Uxbridge, on December 29, 1937, aged 98, probably the oldest member of any of the public medical services. He was born in Dublin on July 1, 1839, the son of Thomas Maunsell, was educated at the Catholic University, Dublin, and took the L.R.C.S.I. in 1859 and the L.R.C.P.I. in 1860. He entered the Army as assistant surgeon on October 1, 1860, was on half-pay from July 24, 1861, to January 14, 1862, attained the rank of surgeon colonel on March 10, 1892, of surgeon general on November 24, 1895, and retired on July 1, 1899. He served in Burma in 1886–7, was mentioned in dispatches G.G.O. No. 864 of 1887, and received the frontier medal; and in the Chitral war on the North-West Frontier of India in 1895 as principal medical officer of the relief expedition, was mentioned in dispatches in the *London Gazette* of November 15, 1895, and received the medal with a clasp and the C.B. In the old regimental days he served in the 48th Foot, now the 1st Battalion of the Northamptonshire Regiment, and in the Royal Artillery. There can be few medical officers left who served in the R.A.M.C. under the regimental system. His university conferred on him the LL.D. He was a founder of the Guild of St. Luke, St. Cosmas and St. Damien, which has already celebrated its silver jubilee. In 1872 he married Mary Eleanor, daughter of the late Major F. W. Lane of the 67th Foot, and had one son and one daughter.

Colonel ANTHONY JOHN LUTHER, C.B., late R.A.M.C., died suddenly at Camberley on December 11, aged 73. He was born at Donnybrook, Co. Dublin, on May 17, 1864, the eldest son of the late Canon Luther of Co. Limerick. He was educated at Trinity College, Dublin, and took the L.R.C.S.I. in 1884 and the L.R.C.P.I. in 1885. He entered the Army as

surgeon on July 27, 1887, became colonel in the long war promotion list of March 1, 1915, and retired on September 10, 1919. He served in the Nile campaign of 1898, when he was present at the battle of Khartum, receiving the medal, also the Egyptian medal with a clasp; and in the war of 1914–18 he was mentioned in dispatches in the *London Gazette* of February 17, 1915, January 4, 1917, and December 24, 1917, and received the C.B.

Colonel T. E. L. BATE, whose military career was briefly recorded in this column on December 18, 1937, studied at Trinity College, Dublin, and shortly after qualifying as a doctor worked for a year as assistant to a general practitioner in Sheffield. On being appointed to the Indian Medical Service he was posted to the Punjab, and shortly afterwards found himself at Peshawar during the progress of the Afghan War of 1879–80. He was later given the post of medical officer to the Lieutenant-Governor of the Punjab, and in that position had opportunities of travelling all over the Province and becoming acquainted with numerous officials and problems outside his own service. Later on he became civil surgeon of Delhi, and from Delhi was transferred to the Provincial headquarters as Inspector-General of Prisons, a post which he held for fourteen years (1891 to 1905). During absences on leave he visited many prisons both in the British Isles and on the Continent, gaining a mastery of his subject which enabled him to introduce many valuable reforms and secured for him in 1902 the C.I.E. After retirement he travelled in various parts of the world, including Canada and South Africa. When the great war broke out he undertook important duties in connexion with Red Cross work in London, and these services were recognized by the conferment in 1918 of the C.B.E.

Colonel DOUGLAS WARDROP, C.B., C.V.O., late R.A.M.C., died at Camberley on December 25, 1937, aged 83. He was born at Barnsbury on February 11, 1854, and was educated at Aberdeen, where he graduated M.B., C.M. in 1875. He entered the Army as surgeon on March 6, 1880, attained the rank of colonel on August 14, 1907, and retired on February 11, 1911. He served as civil surgeon in South Africa in 1879, taking part in the operations against Seku Kuni and in the Zulu War (medal and clasp), and in the Nile campaign in 1898, when he was present at the battle of Khartum, was mentioned in dispatches in the *London Gazette* of September 30, 1898, and received the medal with clasp and the Egyptian medal. From 1902 to 1911 he was commandant of the Royal Army Medical College at Millbank, London, and after retirement he was appointed governor of King Edward VII's Convalescent Home for Officers at Osborne, Isle of Wight. He received the C.V.O. in 1909 and the C.B. in 1917.

Major HERBERT OWEN MARSH BEADNELL, R.A.M.C. (ret.), died in a nursing home at Cardiff on December 15, aged 58. He was born on July 27, 1879, the son of the late Major C. E. Beadnell, R.A., J.P., of Llandinam, and was educated at Guy's Hospital. He took the M.R.C.S.Eng., L.R.C.P.Lond. in 1904, and on July 30 in that year he entered the R.A.M.C. as lieutenant. He became major on July 16, 1916, and retired on April 15, 1919. After the war of 1914–18 he was medical officer in charge of the electrotherapeutic department of the Ministry of Pensions Convalescent Centre at Saltash. He had been a member of the British Medical Association for twenty-five years.

Surgeon Captain ROBERT DUNDONALD JAMESON, C.M.G., R.N. (ret.), died at Fleet, Hants, on January 2. He took the Scottish triple qualification in 1893 and entered the Navy soon afterwards. He attained the rank of surgeon commander on May 10, 1908, and retired with an honorary step of rank as surgeon captain on January 1, 1922. He served throughout the war of 1914–18, receiving the medals, also the C.M.G. and the Legion of Honour, as Chevalier.

Surgeon Captain GEOFFREY CARLISLE, R.N. (ret.), died on January 2. He was the son of the late Paymaster-in-Chief John Carlisle, R.N. He took the M.R.C.S.Eng., L.R.C.P. Lond. in 1904, after which he entered the Navy. He attained the rank of surgeon commander on November 10, 1919, and retired with an honorary step of rank as surgeon captain on September 14, 1928. He served through the war of 1914–18, receiving the medals.

Lieut.-Colonel CHARLES BRAMHALL, R.A.M.C. (ret.), of Warsash, Hants, died in London, after a long illness, on December 25, 1937, aged 60. He was born on February 20, 1877, educated at the London Hospital, and took the M.R.C.S. Eng., L.R.C.P.Lond. in 1902. He entered the R.A.M.C. as lieutenant on January 31, 1903, after filling the post of house-surgeon at Bolingbroke Hospital, and became lieutenant-colonel after the end of the war. He served in the war of 1914–18, and received the Order of Officer of the Crown of Italy in 1920. He joined the British Medical Association in 1922. He served as adjutant in the R.A.M.C., Territorial Force, from November 1, 1911, to July 15, 1915.

Lieut.-Colonel WILLIAM HAMILTON BROUN, R.A.M.C. (ret.), died at Higher Woodway, Teignmouth, on December 26, 1937, aged 83. He was born at Pembrey, Carmarthenshire, on July 19, 1854. His surname was originally Briggs, which he changed to Broun by deed poll dated October 8, 1894. He entered the Army as surgeon on September 20, 1875, was promoted to surgeon major for services in Egypt on June 15, 1885, and retired with a gratuity on November 8, 1890. He was restored to the establishment, and his retirement cancelled, in 1893, promoted to surgeon lieutenant-colonel on September 30, 1893, and retired on December 20, 1893. He served in the Afghan War of 1879–80 (medal) and in the Indian campaign of 1885 (Egyptian medal with clasp and Khedive's bronze star). He was surgeon to the Governor of Madras from November, 1886, to March, 1889.

Lieut.-Colonel JOHN BERESFORD CHRISTIAN, I.M.S. (ret.), died in a nursing home in London, on December 31, 1937, aged 64. He was born at Tentersfield, New South Wales, on April 2, 1873, was educated at St. George's Hospital, and took the M.R.C.S.Eng., L.R.C.P.Lond. in 1900. He entered the Indian Medical Service as lieutenant on June 27, 1901, became lieutenant-colonel on December 27, 1920, and retired on June 27, 1928. After eight years' service in the Army he entered civil employ in May, 1909, was again in military employ during the war, from 1914 to 1918, when he rejoined his civil post, and finally reverted to military employ on December 1, 1924. After retiring he settled at Coonoor in the Nilgiri Hills in Southern India.

Universities and Colleges

UNIVERSITY OF LONDON

A course of six public lectures on "Chemical Structure and Pharmacological Action" will be given by Dr. H. R. Ing at University College, Gower Street, W.C., on Mondays, January 17, 24, and 31, and February 7, 14, and 21, at 5 p.m. Mr. H. S. Perera of Colombo will deliver a public lecture on "Phonetics and Psychology" at University College on Wednesday, January 26, at 5.30 p.m. A course of three public lectures on "Surface Chemistry and Biology" will be given by Dr. J. F. Danielli at University College on Mondays, February 28 and March 7 and 14, at 5 p.m. All the above lectures are open to the public without fee or ticket.

Recognition of Teachers

The following have been recognized as teachers of the University in the subjects indicated in parentheses:

Guy's Hospital Medical School: Dr. P. M. F. Bishop (Physiology); Dr. E. R. Boland (Medicine); Mr. K. Hooper, M.R.C.S., L.R.C.P. (Dental Surgery); Dr. A. D. Marston (Anaesthetics); Mr. H. L. Messenger, M.R.C.S., L.R.C.P. (Dental Anatomy); Dr. C. K. Simpson (Forensic Medicine); Mr. T. T. Stamm (Orthopaedics).

Middlesex Hospital Medical School: Mr. P. B. Ascroft (Surgery).

King's College Hospital Medical School: Dr. T. Tennent (Psychological Medicine).

At a meeting of the Senate, held on December 15, 1937, the note in regard to gold medals at the M.D. and M.S. examinations (*Red Book*, 1937–8, pp. 288 and 294; *Blue Book*, September, 1937, pp. 832 and 837) was amended by the addition of the words "or instruments" after the word "books" in the two places in which it occurs.

Dr. A. E. Clark-Kennedy has been appointed Governor of Queen Mary College.

Lectures

A lecture on physiology will be given by Professor A. P. H. de Kleijn of the University of Amsterdam at University College, Gower Street, W.C., on Tuesday, March 15, at 5 p.m.

Professor V. H. Mottram will give a series of ten lectures on dietetics and nutrition at the Kingsway Hall, W.C., on Mondays at 6 p.m., from January 17.

No. 52

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended January 1, 1938. Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for : (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Irish Free State. (e) Northern Ireland. Median values for the last 9 years for (a) and (b).

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for : (a) The 125 great towns (i) in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns (ii) in the Irish Free State. (e) The 10 principal towns (iii) in Northern Ireland.

A dash — denotes no cases ; a blank space denotes disease not notifiable or no return available.

Disease	1938					1937 (Corresponding Week)					1928-36 (Median Value Corresponding Weeks)	
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)
Cerebrospinal fever	35	2	7	4	—	16	3	8	1	—		
Deaths*		1	—				2	—				
Diphtheria	1,417	175	218	90	68	1,013	119	206	30	43	1,107	163
Deaths	43	8	3	7	1	40	7	8	4	—		
Dysentery	247	77	53		—	16	5	42		—		
Deaths				—	—				—	—		
Encephalitis lethargica, acute	1	—	—		—	4	—	—		—		
Deaths		2					—					
Enteric (typhoid and paratyphoid) fever	34	7	4	6	24	21	2	6	2	—	23	—
Deaths	7	4	—	—	—	2	—	—	—	—		
Erysipelas			105	10	8			74	7	7		
Deaths		—					2					
Infective enteritis or diarrhoea under 2 years												
Deaths	72	17	10	7	5	33	8	8	3	1		
Measles			481		406*			52		4		
Deaths	45	7	4	2	2	1	—	—	1	—		
Ophthalmia neonatorum	104	6	30		—	40	3	15		—		
Deaths												
Pneumonia, influenzal§	1,648	175	24	9	14	832	104	26	2	10	1,080	140
Deaths (from Influenza)	59	10	13	1	2	97	25	8	2	2		
Pneumonia, primary			356	17				193	10			
Deaths		23		42	26		20		27	15		
Polio-encephalitis, acute	—	—				—	—					
Deaths												
Poliomyelitis, acute	6	1	1		—	3	1	1		—		
Deaths		—					—					
Puerperal fever	†	5	13	1	1	22	1	13	1	1		
Deaths		1‡					2‡					
Puerperal pyrexia	158	12	23		1	72	6	16		3		
Deaths												
Relapsing fever	—	—	—		—	—	—	—		—		
Deaths	—	—				—	—					
Scarlet fever	3,383	188	523	91	67	1,636	130	325	62	35	2,059	249
Deaths	7	—	3	1	—	3	—	3	1	—		
Small-pox	—	—	—		—	—	—	—		—		
Deaths	—	—	—	—	—	—	—	—	—	—		
Typhus fever	—	—	—	—	—	—	—		—	—		
Deaths	—	—		—	—		—		—	—		
Whooping-cough			22		4			203		9		
Deaths	19	3	1	4	1	11	4	4	—	2		
Deaths (0-1 year)	520	100	112	42	40	294	46	86	33	25		
Infant mortality rate (per 1,000 live births)	87	83				46	38					
Deaths (excluding stillbirths)	6,330	1,282	818	248	204	4,350	877	688	170	140		
Annual death rate (per 1,000 persons living)	15.6	16.1	16.7	16.9	18.1	10.3	10.9	14.1	11.8	13.4		
Live births	5,790	1,166	918	360	231	4,255	822	708	184	162		
Annual rate per 1,000 persons living	14.3	14.7	18.8	24.5	20.5	10.6	10.2	14.5	12.8	15.5		
Stillbirths	237	34				220	33					
Rate per 1,000 total births (including stillborn)	39	28				49	39					

(i) 122 great towns in 1936
(ii) 12 " " "
(iii) 9 " " "

* All cases in Belfast alone.
† All cases notified as puerperal pyrexia after October 1, 1937

‡ Deaths from puerperal sepsis
§ Includes primary form in figures for England and Wales and London (administrative county), Northern Ireland.

EPIDEMIOLOGICAL NOTES

Typhoid Fever.—At the time of going to press 292 cases have been notified in the Croydon typhoid outbreak with 39 deaths. During the week ended January 8, 1938, there were no new cases but 5 deaths. Of the 24 cases of enteric notified in Northern Ireland 23 occurred at the Antrim Mental Hospital, near Belfast, while one case was reported from Irvinestown. The hospital outbreak is confined to a women's ward which was originally occupied by nearly fifty patients; two of the patients were fairly ill, but the others are progressing well. There have been no deaths. In the borough of Kensington one case of paratyphoid fever occurred in a nurse on the staff of the Princess Beatrice Hospital. The hospital has been placed in quarantine with suspension of admission, while the work of the out-patient department has been transferred to a welfare centre in the vicinity. There has since been one further case.

Dysentery and Infective Enteritis.—In England and Wales the number of cases notified has dropped from 270 to 247 and in Scotland from 58 to 53, but in London itself there is an increase of 5 cases for the week. The numbers notified are greatly in excess of those during the corresponding week last year. The numbers of deaths from enteritis have increased appreciably in the large towns of the British Isles and are about double those for the corresponding week last year.

Measles.—Measles appears to have taken a firm hold in Manchester, where the numbers notified have been rising for the last few weeks. For the week ended January 1, 1938, 707 cases were notified (first case in each household), with 7 deaths, the same number of deaths as in the previous week. In Salford there were 172 cases and 2 deaths, against 1 death for the previous week. The public health authorities have offered a free supply of immune globulin to practitioners in order to secure for measles contacts the benefit of temporary protection or modification of attack. In Edinburgh 174 cases were notified, as compared with 135 in the previous week, while the deaths increased from *nil* to 2. In Belfast the number of deaths from measles has dropped from 6 in the week ended December 25, 1937, to 2 in the week ended January 1, 1938, but the number of cases notified has risen from 292 to 406. The services of additional health visitors have been secured to assist in the domiciliary care of patients with measles. In London the measles epidemic is slowly gathering force. The deaths have risen from 1 in the previous week to 7 during the week under review.

Medical News

The annual meeting of the Royal Microscopical Society will be held at B.M.A. House, Tavistock Square, W.C., on Wednesday, January 19, at 5.30 p.m., when Dr. R. S. Clay will deliver his presidential address on "A Review of the Mechanical Improvements of Microscopes in the Last Forty Years."

The next meeting of the Society of Radiotherapists will be held at 11, Chandos Street, W., on Friday, January 21, when a discussion on "Impressions of the Chicago Congress and of Radiotherapy in America" will be opened by Dr. N. S. Finzi and Dr. J. E. Roberts.

A meeting of the Maternity and Child Welfare Group of the Society of Medical Officers of Health will be held at 1, Thornhaugh Street, W.C., on Friday, January 21, at 8.30 p.m., when a discussion on "Eugenics and Maternity and Child Welfare Work" will be opened by Dr. Stella Churchill. A meeting of the Fever Hospital Medical Service Group will be held at 1, Thornhaugh Street on Friday, January 28, at 4 p.m., when a discussion on "The Prevention and Treatment of the Enterica Diseases" will be opened by Drs. E. W. Goodall and A. Topping.

The Royal Sanitary Institute, in conjunction with the Northern Branch of the Society of Medical Officers of Health, has arranged a discussion on "The National Campaign for Physical Fitness," to take place at Darlington Town Hall on Friday, January 21, at 4.45 p.m. The discussion will be opened by Dr. G. A. Dawson, and will be followed by several short contributions on different aspects of the subject.

A meeting of the Chelsea Clinical Society will be held at Hotel Rembrandt, Thurloe Place, S.W., on Tuesday, January 18, at 8.30 p.m., when Dr. James Davidson, director, Metropolitan Police Laboratory, Hendon, will open a discussion on "The Work of a Forensic Science Laboratory." The meeting will be preceded by dinner at 7.30 p.m.

An address entitled "The Rational and Empirical Elements in Physics" will be given by Mr. H. Dingle on Tuesday, January 18, at 8.15 p.m., at University College, Gower Street, W.C. Cards of admission may be obtained from the Director of Studies at University Hall, 14, Gordon Square, W.C.1.

The following meetings of the Eugenics Society have been arranged: January 18, 5.15 p.m., Dr. G. F. McCleary, "The Population Problems in the British Commonwealth"; February 16, 7.45 p.m., Galton dinner and lecture by Professor John A. Ryle, "Medicine and Eugenics"; March 22, 5.15 p.m., Miss Evelyn Fox, "Modern Developments in Mental Welfare Work"; May 24, 4 p.m., Annual general meeting; 5.15 p.m., Mr. D. V. Glass, "Population Policies in Scandinavia and Elsewhere"; June 14, 5.15 p.m., Miss Grace G. Leybourne, "The Cost of Education and its Relation to the Size of the Family." All the meetings will be held at the Rooms of the Royal Society, Burlington House, W., with the exception of the Galton dinner and lecture at the Waldorf Hotel.

A David Anderson-Berry Gold Medal, together with a sum of money amounting to about £100, will be awarded in July, 1938, by the Royal Society of Edinburgh to the person who, in the opinion of the council, has recently produced the best work on the nature of *x* rays in their therapeutical effect on human diseases. A similar award will be made every three years. Applications for this prize are invited. They may be based on both published and unpublished work, and should be accompanied by copies of the relevant papers. Applications must be in the hands of the general secretary, Royal Society of Edinburgh, 22, George Street, Edinburgh 2, by June 1, 1938.

According to the recently issued licensing statistics for 1936 the proceedings for drunkenness in 1936 were 52,988, as against 50,032 in 1932 (+5.9 per cent.), 35,407 in 1932 (+49.6 per cent.). The convictions for drunkenness reported as due to drinking methylated spirit were 746 (as against 802 in 1935), of which 634 were in men and 112 in women.

The Treasury has made an Order under Section 10 (5) of the Finance Act, 1926, continuing the exemption of radium compounds from Key Industry duty till August 31, 1938.

Volume XI, No. 1, dated January, 1938, of the *Summary of Current Literature on Water Pollution Research* has just been published by H.M. Stationery Office, price 2s. The annual subscription to these monthly abstracts is 24s., post free. They are prepared by the water pollution research staff of the Department of Scientific and Industrial Research.

According to the *Journal of the American Medical Association* of December 25 statistics from 183 American cities show that there were 14.4 deaths from appendicitis per 100,000 of population during 1936, a slight reduction from the rate of 1935, which was 14.7. The lowest rate on record is 13, which occurred in 1918.

The eleventh International Congress of the History of Medicine will take place from September 3 to 11 in Jugoslavia. The meetings of the congress will be held in Zagreb, Belgrade, Sarajevo, and Ragusa. The following will be the main subjects for discussion: botany and zoology in medicine; the minerals in medicine; medicine in poetry; mysticism and magic in medicine; psychological disorders and psychotherapy in medicine. The president of the congress will be Dr. Lujo Thaller and the secretary-general Dr. Vladimir Bazala. All communications should be addressed to Dr. Bazala, Vlaska ulica 95, Zagreb, Jugoslavia.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

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All communications with reference to ADVERTISEMENTS should be addressed to the Advertisement Manager. Orders for copies of the *Journal* and communications with reference to subscriptions should be addressed to the Secretary, B.M.A. House, Tavistock Square, W.C.1.

The TELEPHONE NUMBER of the British Medical Association and the *British Medical Journal* is EUSTON 2111.

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The address of the B.M.A. Scottish Office is 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh;* telephone: 24361 Edinburgh), and of the Office of the Irish Free State Medical Union (I.M.A. and B.M.A.), 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin;* telephone 62550 Dublin).

QUERIES AND ANSWERS

Frumenty

A non-medical reader sends the following directions for preparing frumenty in answer to the inquiry published on January 1 (p. 53): Anyone who wishes to make frumenty must first buy a pound of wheat, which costs twopence, from his grocer. All grocers do not sell wheat that is clean enough for this use; many only sell it for cattle and hen food. Run cold water over about half of it on a colander to clean it, and then place the wheat in a baking dish with water to cover it, and as much sugar as is necessary, probably one or two tablespoonfuls, and a little nutmeg and a saltspoonful of salt. It needs a great deal of stewing. Even two days in a slow oven is not too much; but at any rate one day, in a moderate oven—that is, so that it simmers all the time—is necessary. It is best covered with a plate to keep it moist. These are the instructions I had from a countrywoman, and I have tested them. The wheat swells and absorbs the water, but it should have more water put in while it is cooking, not allowed to go dry until the end. It must become soft and rather jelly-like. Frumenty ought to be good for the teeth, as it needs a good deal of chewing. It is a "Wakes Week" dish in some Lancashire towns.

Dr. SEYMOUR W. DAVIES (Wallasey, Cheshire) writes: About fifty years ago frumenty (or furmetty, as we called it) was often served in our family at breakfast as a change from porridge, and we all liked it. It was made in the following way. Wheat, in a stone jar, is covered with water, allowing for expansion, which is considerable when the wheat swells. The jar is put in the oven and stewed gently for hours, until the grains have burst and have absorbed the water, leaving a soft mash. A tablespoonful or so of the mash is put into a pint basin, covered with plain white sauce, syrup added, the whole stirred well, and eaten with a spoon. We like a dash of powdered cinnamon. An excellent meal, but rather troublesome to prepare in these degenerate days of pre-cooked cereals.

Herpes and Varicella

Mr. L. A. RIDDELL, F.R.C.S. (Redruth), writes in reply to Dr. I. H. Lloyd-Williams (*Journal*, January 1, p. 54): One might almost say that herpes zoster is endemic in Cornwall, so common is it here. From time to time one certainly does see "chicken-pox in the little girl and grannie with zoster"; but with the majority of cases of either of the two diseases no such association is found. Moreover, varicella attacks healthy children, whereas I fancy that zoster prefers the debilitated, though it is difficult to separate cause and effect. To my mind the greatest argument against the identity of the two is the fact that varicella commonly causes nothing but a little skin irritation, whereas zoster, even when it occurs in a child, nearly always causes severe pain as well, at least in the early stages. If they are caused by the same virus, then in chicken-pox it must be confined to the skin, while in zoster it must (as is usually believed) affect the cutaneous nerves directly. This is not difficult to believe seeing that both are ectodermal structures. But in this case, is the primary lesion in the dorsal root ganglia, as I believe I was taught?

Income Tax

Partnership Assessments

"L. s. d." has sent inquiries the purport of which will be clear from the replies below.

*** (1) The income tax assessment is made on the firm as such and not on the individual partners, and the collector's receipt for the tax when paid is given accordingly, and a partner cannot claim to have an official receipt for his share of the firm's tax.

(2) The return or declaration of income, however, is made by each partner separately, including therein his share of the firm's liability, which should agree with the return made by the precedent acting partner stating the *firm's* liability.

(3) The official notice of assessment shows the personal allowances and reliefs aggregated, but the inspector of taxes will supply an individual partner on request with a note stating what he is personally entitled to and what is accordingly included in his account in the official notice.

LETTERS, NOTES, ETC.

Hire and Supply of Gas Apparatus

"GASSED" (London, W.9) writes: I would like to know the opinion of the profession on the hire and supply of gas and oxygen; also whether a less arbitrary form of charge would not be more satisfactory. I have recently had the following experience with a large supply firm. I hired a gas and an oxygen cylinder on the understanding that I paid for what I used in the first six months, afterwards at the rate of 6d. each cylinder a week. At the end of six months I returned the cylinders, and was charged 3s. for the gas and 2s. 4d. for oxygen. What I had actually used was one fill of the gas bag to my Clover apparatus and no oxygen at all. The firm state the valves were in perfect order, and I certainly saw the gas tap was off and tight after use. So that the whole affair is most unsatisfactory, which gives no encouragement to keep gas or oxygen in the house for emergencies. It would probably be better to pay a small hire charge from the start.

The Bicentenary of Parmentier

The *Canadian Pharmaceutical Journal* for December 15, 1937, includes an annotation on the French pharmacist, Antoine Auguste Parmentier (1737–1813), who made France "potato-minded." While a prisoner of war in Germany—he had joined the French Army Pharmaceutical Service in Hanover in 1757—he learnt to recognize the merits of the potato, then his chief article of diet. Returning to Paris as *pharmacien-adjoint* at the Hôtel des Invalides, against popular indifference and prejudice he introduced the potato into every restaurant menu and was responsible for the cultivation of the plant on an extensive scale. To encourage him Louis XVI wore a sprig of potato leaves in his buttonhole. In 1800, under Napoleon, Parmentier became general of the sanitary corps, and later prepared a pharmaceutical code, which was adopted by many hospitals. His publications are numerous and interesting, but betray the lack of a sound academic training in his early days. His two-hundredth anniversary was recently celebrated in his native town, Montdidier, by a gastronomic pilgrimage to the site of the house where he was born (the house itself was destroyed during the war of 1914–18) and by other ceremonies in which potatoes had a place of honour.

Vaccines and Sera

We have received from British Drug Houses, Ltd., Graham Street, City Road, London, N.1, a booklet entitled *B.D.H. Vaccines and Sera.* Short notes are given on the methods of employing various vaccines and sera, and a price list of these is included at the end of the booklet, which will be sent free to anyone who cares to apply.